

PHYTOLOGIA

An international journal to expedite botanical and phytoecological publication

Vol. 58

October 1985

No. 4

CONTENTS

TURNER, B.L., <i>A new scapose Acourtia (Asteraceae — Mutiseae) from south-central Mexico</i>	225
TURNER, B.L., <i>New species and names in Zaluzania and Viguiera (Asteraceae — Heliantheae)</i>	228
ST. JOHN, H., <i>Touchardia angusta (Urticaceae) Hawaiian Plant Studies 128</i>	231
JUDD, W.S., <i>A revised traditional/descriptive classification of fruits for use in floristics and teaching</i>	233
HOLMES, W.C., <i>Studies in Mikania (Compositae) — XII</i>	243
ROBINSON, H., <i>Studies in the Heliantheae (Asteraceae). XXXXI. A new species of Aspilia from Brazil</i>	245
ROBINSON, H., & KAHN, B., <i>A new species of Stiffitia from Cayenne (Asteraceae: Mutiseae)</i>	248
ROBINSON, H., & KAHN, B., <i>New species of Vernonia from Bolivia and Peru (Vernonieae: Asteraceae)</i>	252
KING, R.M., & ROBINSON, H., <i>Studies in the Eupatorieae (Asteraceae). CCXXI. Additional species from tropical America</i> ...	258
LUNDELL, C.L., <i>Neotropical Myrsinaceae — XVII</i>	273
MOLDENKE, H.N., <i>Notes on the genus Clerodendrum (Verbenaceae). VIII</i>	279
MOLDENKE, A.L., <i>Book reviews</i>	304

Published by Harold N. Moldenke and Alma L. Moldenke

590 Hemlock Avenue N.W.
Corvallis, Oregon 97330
U.S.A.

Price of this number \$3.00; for this volume \$15.00 in advance or \$16.00 after close of the volume; \$5.00 extra to all foreign addresses and domestic dealers; 512 pages constitute a complete volume; claims for numbers lost in the mails must be made immediately after receipt of the next following number for free replacement; back volume prices apply if payment is received after a volume is closed.

A NEW SCAPOSE ACOURTIA (ASTERACEAE-MUTISEAE)

FROM SOUTH-CENTRAL MEXICO.

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Recent collections from the poorly collected montane regions of south-eastern Pueblo has revealed the following novelty.

Acourtia tenoriensis B. L. Turner, sp. nov. Fig. 1.

A. scapiformis accedens sed capitulis magnioribus campanulatis; pedunculis brevioribus; indumentis involucris densis ferrugineis tomentosis.

Perennial scapose herbs 40-50 cm high. Stems single, terete, purplish, thinly tomentose to glabrate, arising from fibrous roots crowned with tufts of elongate, tawny, silky hairs. Leaves rosulate, obovate-elliptical in outline, 5-10 cm long, 3-4 wide; petioles to 1.5 cm long, tawny tomentose; blades irregularly serrate to 5-7 lobed, the lobes also serrulate, glabrous on both surfaces, or nearly so. Heads campanulate, 4-8 in corymbose racemes. Involucres 4-5 seriate, imbricate, 9-10 mm high, 10-12 mm wide; bracts densely brown-tomentose, the outermost lanceolate, 3-4 mm long, apiculate with claw-like appendages, the innermost linear-oblancheolate with rounded apices, often terminated with a short appendage. Receptacle plane, ca 3 mm across. Florets 30-50; corollas "blancas," bilabiate, glabrous, 7-8 mm long; tube ca 3.5 mm long; limb ca 4 mm long, the lobes 2.5-3.5 mm long. Achenes columnar, densely hispid, 5-6 mm long; pappus of numerous, ciliate, pale-brownish bristles ca 6 mm long.

TYPE: MEXICO. Pueblo: Mpio. Tamazulapan, Cerro Pericon, al NW de San Pedro Nopala, 2460-2660 m, abundant in "Econtonia matorral espinoso-encinar. Suelo cafe rojizo sobre roca ignes." 21 Oct 1984, P. tenoria L. 7871 (holotype TEX; isotypes MEXU, to be distributed).

A revisional treatment of the scapiform elements of Acourtia was last rendered by Turner (1978). He recognized 10 species. Since that time Rzedowski (1983) has described 2 additional species plus a new variety of A. hualupana. With the present description 13 scapiform species can be recognized for Mexico, most of these centered in the drier montane regions of south-central Mexico.

Acourtia tenoriensis is nearest A. scapiformis (Bacig.) Turner, but differs in having larger, less pedunculate, campanulate heads whose involucre bracts are covered with a dense, rusty-brown

felt or tomentum. Their leaves, however, are very similar. In fact Tenorio collected rather typical A. scapiformis at least 3 times in the general vicinity of the type locality of A. tenoriensis (7871, 7826, 7939; MEXU, TEX), and all are very similar. Acourtia tenoriensis is strikingly different, and I have no hesitation in naming the species for its only known collector, Mr. P. Tenorio, a field botanist with MEXU, whose meticulous well-documented collections are a pleasure to work with.

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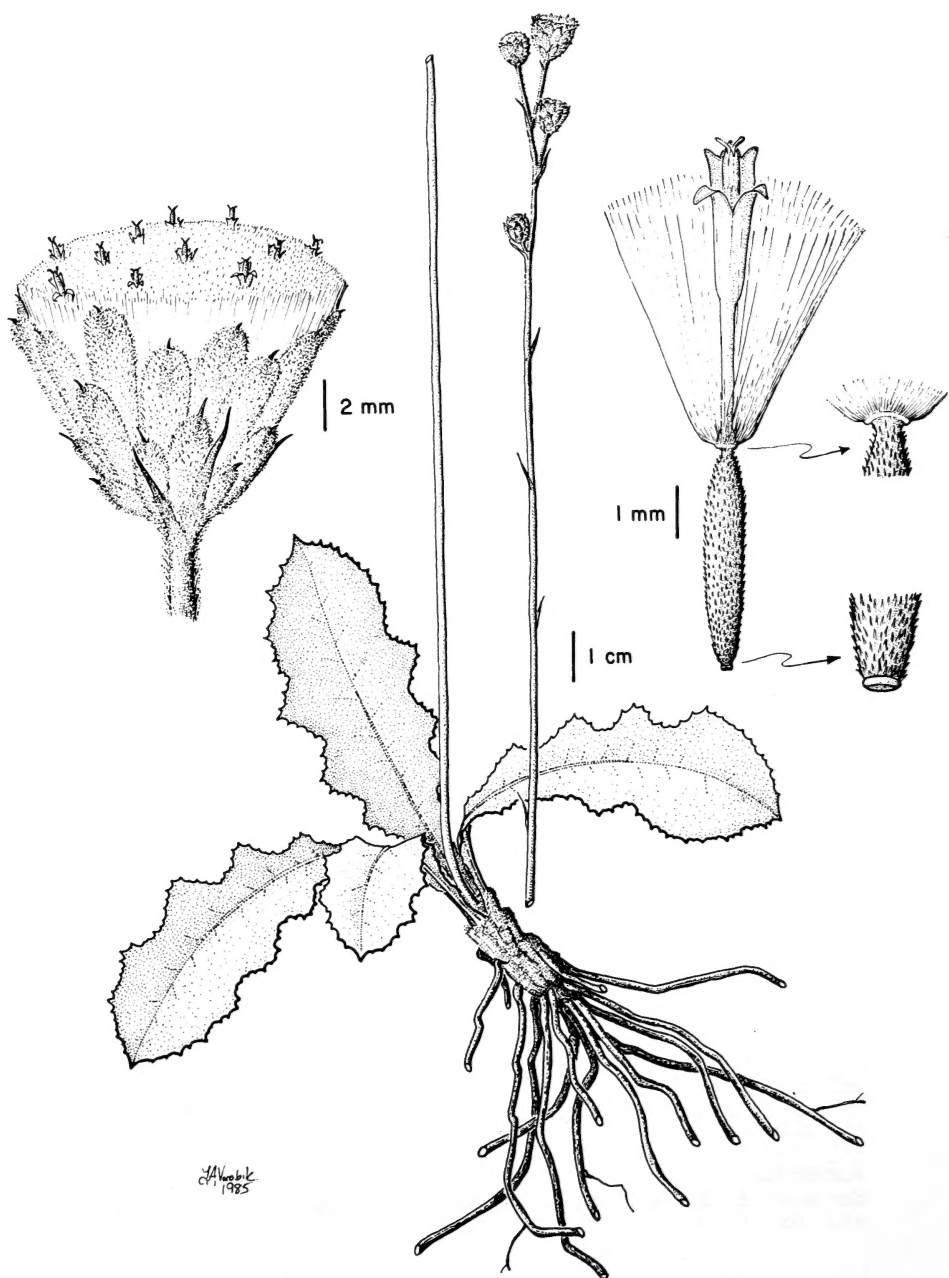


Fig.1 ACOURTIA TENORIENSIS, from holotype

NEW SPECIES AND NAMES IN ZALUZANIA AND VIGUIERA

(ASTERACEAE-HELIANTHEAE).

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Recent collections from northwestern Mexico have revealed a new species of Zaluzania, which I describe below. In addition, I have had to rechristian my recently described Viguiera conquistii from Oaxaca, Mexico, there being an earlier described fossil plant with this name.

Zaluzania delgadoana B. L. Turner, sp. nov.

Zaluzania megacaphala accedens sed foliis parvioribus valde petiolatis, pubescentiis hirsutulis, capitulis parvioribus.

Shrub 1.2-3.0 m high. Stems terete, brittle, densely hirsutulose. Leaves 3-4 cm long, 1.5-2.7 cm wide; petioles 6-10 mm long, hirsutulose; blade deltoid-triangular to nearly cordate, abruptly truncate to cordate at the base or rarely ovate and tapering onto the petiole, densely short hirsutulous on both surfaces, the lower surface very veiny and abundantly covered with punctate atomiferous glands, the margins inconspicuously crenulodentate. Heads hemispheric, 30-40, in rounded, terminal cymules, 7-10 cm across, 4-7 cm high. Involucre broadly campanulate, 2-3 seriate, 3.5-4.5 mm high, 7-9 mm wide; bracts subequal, lance-ovate (outer) to oblanceolate (inner) and somewhat trifold, densely puberulent and atomiferous glandular. Receptacle conicle, ca 2.5 mm high, ca 1.5 mm across. Chaff persistent; pales ca 4 mm long, pubescent, 3-lobed apically. Ray florets 5-8, pistillate, fertile; corollas yellow, 5-6 mm long; tube ca 1 mm long; lamina ca 5 mm long, ca 4 mm wide. Disk florets numerous; corollas yellow, ca 3 mm long, pubescent, the tube lapping-over and capping the achene. Anthers yellow. Achenes of both ray and disk florets similar, epappose, ca 3 mm long, glabrous.

HOLOTYPE: MEXICO. DURANGO: Mpio. Nombre de Dios, Puente Nombre de Dios, a 47 km de los limites Zacatecas-Durango, sobre la carretera que va a Durango. Matorral con Opuntia, Mimosa y Condalia. Ladera muy pedregosa y perubada, 1790 m, 6 Nov 1978, J. Garcia P. y A. Delgado S. 873 (holotype TEX; isotypes MEXU, to be distributed).

ADDITIONAL COLLECTION: DURANGO: Mpio. Nombre de Dios, ca 4 km W de la Parrilla, ca 2050 m, 25 Oct 1983, S. Gonzalez & S. Acevedo

2760 (TEX); 28.1 mi E of intersection of highways 40 and 45, along highway 45, 28 Sep 1984, Sundberg & Lavin 2903 (MEXU, TEX).

The holotype describes the plant as a frequent "Arbusto de 1.2 m de alto, tallos principales partiendo casi desde la base...". Gonzalez & Acevedo note the plant to be common, 2-3 m high, occurring in a "matorral de Juniperus, con Rhus, Prosopis y Condalia en las partes bajas."

I have retained the holotype several years now thinking this might be an aberrant specimen of the widespread, highly variable, Viguiera dentata (Cav.) Spreng. with epappose achenes. The arrival of two additional collections from approximately the same area convinced me that it was an undescribed taxon, perhaps belonging to Viguiera, but on technical grounds better placed in the small genus Zaluzania. The latter is kept out of Viguiera primarily by its pistillate fertile ray florets, those of Viguiera possessing sterile achenes. If positioned in Viguiera, it would fit most comfortably in the Section Chloracra near or in the series Pinnatilobatae (Blake, 1918). Olsen (1979), in his monograph of the genus, also reckoned Zaluzania to be related to the Section Chloracra favoring the series Grammatoglossae since the species of that group show "a tendency for the tube of the disc corolla to become expanded to form a cap over the achene." Such tendencies also occur in the series Pinnatilobatae. In any case Olsen transferred Zaluzania grayana Rob. & Greenman, which has a "capping" corolla, to Viguiera, series Grammatoglossae, largely because it possessed sterile ray florets and a base chromosome number of $x=17$.

I suspect that sterile versus fertile ray achenes is but the expression of a few genes. The overall morphology of Zaluzania strongly suggests that it belongs in Viguiera, the present species, what with its Viguiera-like leaves, tends to bridge the "eye-ball" gap and it should be noted that occasional specimens of Zaluzania at TEX show neuter ray florets, and presumably sterile achenes (e.g. Z. megacephala Sch.-Bip.; Hinton 18621, Sundberg et al. 1903, etc.).

It is a pleasure to name this species for Dr. Alfonso Delgado, ex-student at the University of Texas and currently curator of the herbarium, UMEX, and among the first to participate in its discovery.

Viguiera neocronquistii B. L. Turner, nom. nov. - Viguiera cronquistii B. L. Turner Phytologia 57: 494. 1985. - not V. cronquistii Becker, Palaeontographica 127: 126. 1969, a fossil plant.

I am embarrassed to admit that in describing V. cronquistii memory failed its function, for I was once fully aware of Becker's fossil name, having commented upon its possible validity, as noted by Crepet and Stuessy (1978) in their reappraisal of the compression concerned.

But perhaps my subconscious would not permit me to acknowledge a fossil Cronquist! He's living and well as we all know, hence the more appropriate, neocronquistii. I am grateful to Tod Stuessy, my ex-student, who called the error to my attention without the least hint of a snicker.

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Touchardia angusta (Urticaceae)

Hawaiian Plant Studies 128

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The genus *Touchardia* of the Urticaceae has been considered monotypic and with its only species, *T. latifolia* Gaud., occurring on all the major Hawaiian Islands. Its stem contains a tube of long, pliant, long lasting fibers. These were prized and much used by the Hawaiian people who called the plant "olonā." It is here indicated that a second species of the genus occurs on the island of Hawaii.

Touchardia angusta sp. nov.

Diagnosis Holotypi: Frutex dioecius est, illis masculis 1-2 m altis, caulibus hirsutulis, stipulis 4.5-5.5 cm longis hirsutulis, petiolis 7-20 mm longis hirsutulis, laminis 13-29 X 5-11 cm chartaceis lanceolatis acuminatis, infra in nervis puberulis, pedunculis masculis 10-25 mm longis, capitibus 1-2 cm diametro globosis, tubo calycis 2 mm longis, 5 lobis 2-2.2 mm longis lanceolatis, filamentis 2.5 mm longis, antheris 1 mm longis subglobosis.

Diagnosis of Holotype: Shrub dioecious; staminate plants 1-2 m tall, mostly single stemmed, these hirsutulous; bundle scar solitary; stipules 4.5-5.5 cm long, appressed hirsutulous; petioles 7-20 mm long, appressed hirsutulous; blades 13-29 X 5-11 cm, chartaceous, lanceolate or elliptic lanceolate, acuminate, the margins undulate or crenulate towards the apex, below puberulent on the veins; staminate peduncles 10-25 mm long, axillary; heads 1-2 cm in diameter, globose; buds 2.5 mm in diameter; calyx tube 2 mm long; 5 lobes 2-2.2 mm long, lanceolate; filaments 2.5 mm long; anthers 1 mm long, subglobose.

Pistillate Plants: Habit similar; cyme 0.7-1 cm long; heads 4-7 mm in diameter, globose, green; flowers 150-200 in a head; each flower subtended by 3 bracts, the flower 2-2.5 mm long, whitish; calyx 1.5-1.9 mm long, oblanceoloid, the 4 lobes 0.7-0.8 mm long, oval, cucullate, glandular denticulate on the margins, the two outer the larger; ovary fusiform; in fruit the calyx becomes fleshy, orange, ellipsoid, berry-like, 3.5 X 2.5 mm; achene 1.5-2.1 mm, discoid, beaked.

Holotypus: Hawaiian Islands, Hawaii Island, Olaa, 15 3/4 Mile Road, rainforest, 1,800 ft alt., July

1, 1943, H. St. John 20,343 (BISH). Type examined.

Distribution: Hawaii Island, in rain forests from Olaa and Pahoa to Kilauea and Kulani, and in the Kohala Mountains.

Discussion: Touchardia angusta is related to T. latifolia Gaud., of the Hawaiian Islands, a species with the staminate plants with the blades ovate (or lance ovate), acute, below the veins hirsute to hirsutulous; floral bracts 2.5-3 mm long, lanceolate, from a truncate base, entire; calyx tube 1 mm long, cupuliform, and the lobes 1-1.5 mm long.

T. angusta has the blades lanceolate or elliptic lanceolate, acuminate, below the veins puberulent; floral bracts elliptic lanceolate; calyx tube 2 mm long, funnelform, and the lobes 2-2.2 mm long.

A REVISED TRADITIONAL/DESCRIPTIVE CLASSIFICATION OF FRUITS FOR USE IN FLORISTICS AND TEACHING.¹

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Summary

A revision of the traditional/descriptive classification of fruits is presented in order to reflect more accurately the great morphological diversity of tropical fruits. This is accomplished not only by broadening the definition of some terms, e. g., berry, drupe, capsule, schizocarp, achene, but also by the addition of a few distinctive fruit types, e. g., indehiscent pod, dehiscent drupe, and early-dehiscent fruit.

Introduction

The great diversity of size, form, texture and anatomy of fruits has long confounded plant morphologists, reproductive biologists, and taxonomists, as clearly can be seen in the broad array of fruit classifications (Baumann-Bodenheim, 1954; Egler, 1943; Gray, 1877; Janchen, 1949; Kaden and Kirpicnikow, 1965; Lawrence, 1951; Levina, 1961; van der Pijl, 1972; Radford et al., 1974; Rendle, 1930; Stopp, 1950; and Winkler, 1939. For various reasons these classifications have been only partly successful. Some of the problems of fruit classification are briefly discussed below, and a practical system for floristic or teaching purposes is presented.

All systems of fruit classification must deal with several serious difficulties. First, and foremost, is the problem of the bewildering and often continuous variation of fruit structure. In fact, Van der Pijl (1972; p. 17) concluded that "the fruit is too versatile and has too many aspects to be divided into strict categories." However, many workers have attempted to impose inadequate and rigid systems with mutually exclusive categories which fail to recognize the intermediate types (see Sattler, 1966). Thus if the fruit of Prunus or Nectandra is a drupe (i. e., fleshy, single "stone"), and that of Vaccinium or Solanum a berry (i. e., fleshy, many seeded), what is the fruit of Ilex, Clerodendrum, Psychotria, or Cordia (i. e., fleshy, several stones)? The results have often been artificial and inconsistent classifications which are not universally valid, or even useful. Additional complexities are added by the extensive parallel/convergent evolution of fruiting structures; functionally similar

¹This paper is Florida Agricultural Experiment Station Journal Series No. 4981.

fruits have arisen independently in different lineages of angiosperms from similar and different gynoecial conditions. Even other parts of the flower (or associated vegetative structures) -- in addition to the matured pistil -- may form a functional part of the fruit. However, the distinction between "accessory fruits" and fruits derived only from gynoecial tissues frequently becomes blurred. Certainly no useful distinction can be made when (fleshy to dry) accessory structures are completely fused to ovarian tissue as in those fruits derived from flowers with an inferior ovary, e. g., the berries of Opuntia, Hamelia, Eugenia, Musa, or Vaccinium, the capsules of Lachnanthes or Couroupita, the achenes of Bidens, the pomes of Pyrus, or the drupes of Scaevola or Terminalia. This extensive homoplasia has led to the frequent comparison of non-homologous structures and confusion in phylogenetic investigations. A third major problem with many fruit classifications concerns their temperate (i. e., European and North American) bias, with an undue stress on pericarp fruits. Many only slightly distinctive temperate fruit forms are given names (e. g., silique vs. silicle) while many more distinctive tropical fruits are ignored (see van der Pijl, 1972). For example, what is the fruit type of Adansonia, Crescentia, Rigelia (indehiscent, + dry, many seeded), Aegle, Durio, Theobroma (indehiscent, outer portion + hard, fleshy within, many seeded), Akebia, Tabernaemontana (fleshy follicle), Carya, Rhamnus (some) (dehiscent drupe), Caulophyllum (early-dehiscent), Heliconia (splitting into one-seeded drupe-like segments), Ilex, Cordia (indehiscent, fleshy, with several stones), Litchi, Nephelium (indehiscent, fleshy, ariloid, one-seeded), Momordica (fleshy capsule), Persea americana (indehiscent, fleshy, one-seeded), Sterculia (carpels early separating into follicle-like units), Tamarindus (indehiscent, fleshy, several seeded "legume"), to name only a few? This temperate bias has hampered the teaching of systematics in tropical regions, and has led to an incomplete appreciation of the diversity of tropical groups. Consider the various of fruit forms summarized by the term legume in the tropical Fabaceae.

In working through the problems alluded to above, morphologists and taxonomists have relied on diverse criteria in constructing fruit classifications. However, most fruit classifications fall into three general categories: (1) traditional/artificial systems--based on Gray (1877) and widely used in taxonomy texts (Jones and Luchsinger, 1979; Lawrence, 1951; Pool, 1941; Porter, 1967; Rendle, 1930; and Smith, 1977), (2) morphological systems--popular in eastern Europe, (Kaden and Kirpicnikow, 1965; Levina, 1961), and (3) functional systems--based on mode of dispersal (van der Pijl, 1972). It is beyond the scope of this paper to undertake a detailed comparison and evaluation of these diverse approaches to the classifications of fruits. However, a few comments are appropriate.

Traditional systems emphasize pericarp texture and dehiscence; such systems are obviously artificial and have

numerous exceptions since the few fruit types recognized are arbitrary points along a continuum of variation and have no necessary correlation with the morphology of the gynoecium (and associated floral and vegetative structures) from which they were produced. Such terms are useful in descriptive botany (e. g., in floras, keys, and for teaching but lead to errors in phylogenetic/monographic studies due to the arbitrary and non-homologous nature of the recognized categories. (For example, the capsules of Blighia, Casearia, Epidendron, Lecythis, Lyonia, Maytenus, and Oxalis, or the achenes of Bidens, Clematis, Cyperus, and Ostrya, have little in common other than a very superficial external resemblance.) In contrast, botanists using strictly morphological fruit classifications attempt to define terms with morphological/anatomical exactness, stressing a precise ontogenetic connection between flower and fruit structures (Kaden and Kirpicnikow, 1965). Such systems are useful in phylogenetic and monographic studies since recognized fruit types not only show less intra-category variability but also are more likely to represent homologous structures, thus allowing for more meaningful taxonomic comparisons. However, the number of fruit types characterizing the more "fanatical" and detailed morphological systems is often in the hundreds, leading to problems of communication. The usefulness of such schemes is thus much lessened in teaching or floristics. Finally, functional classifications (van der Pijl, 1972), although very appropriate in ecological studies, have not been widely used by taxonomists and are not adequate for conveying the form of the fruit.

In this paper an artificial system of purely descriptive fruit terms is presented, based on the traditional system. A fruit is considered to be a matured pistil (simple or compound) along with fused accessory structures. Simple fruits (those resulting from a single flower) are divided into two categories: first, those formed from a single pistil (simple or compound), and, second, those from several separate pistils (carpels) of a single gynoecium - i. e., "aggregate fruits". The individual fruits of an "aggregate fruit" may be of any of the basic fruit types given in the following key, e. g., follicles in Magnolia, berries in Annona, or drupes in Rubus. The important diversity of fruits seen in tropical regions has been stressed both by applying some definitions more broadly and by adding a few new fruit terms. The use of descriptive terms (e.g., drupacepus schizocarp, winged or samaroid schizocarp, one-seeded fleshy capsule) is also encouraged. The classification is presented by means of an indented key and a series of definitions. Although the system presented herein is admittedly arbitrary, the key and descriptions have proved to be useful in teaching introductory and advanced systematics in both northern temperate and southern tropical Florida. It is hoped that this paper will stimulate further interest both in the terminology of fruits and in the use of fruit characters in the teaching of systematics.

A Key To Fruit Types

- A. Fruit the product of several flowers clustered in one mass. MULTIPLE FRUIT
(composed of any of the following fruit types).
- A. Fruit (if carpel solitary, or several and fused) or fruits
(if carpels several and free) the product of a single flower.
 - B. Fruit not opening (indehiscent).
 - C. Fruit fleshy (at least in part).
 - D. Texture of fruit + homogeneous (except for seeds), fleshy throughout. BERRY.
 - D. Texture of fruit heterogeneous.
 - E. Outer part of fruit firm, hard or leathery. BERRY.
(Including the hesperidium, pepo, amphisarca.)
 - E. Outer part of fruit + soft.
 - F. Center of fruit with one or more hard "stones" (pyrenes) enclosing seeds. DRUPE.
 - F. Center of fruit with papery or cartilaginous structures enclosing seeds (ovary inferior). POME.
 - C. Fruit dry.
 - G. Fruit with several to many seeds. INDEHISCENT POD.
 - G. Fruit usually only one seeded.
 - H. Fruit winged. SAMARA.
 - H. Fruit wingless.
 - I. Pericarp (wall of fruit) thick and bony; fruit generally large. NUT.
 - I. Pericarp thin; fruit smaller.
 - J. Pericarp loose and free from the seed UTRICLE.
 - J. Pericarp firm, close-fitting or fused to seed.
 - K. Pericarp close-fitting, but free from the seed. ACHENE.
 - K. Pericarp adnate (fused) to the seed CARYOPSIS.
 - B. Fruit opening or breaking apart (dehiscent).
 - L. Ovary rupturing early in development and subsequently withering, the seed(s) maturing externally. EARLY DEHISCENT FRUIT.
 - L. Ovary opening later in development, not withering.
 - M. Fruit from a single carpel.
 - N. Fruit dehiscing along a single suture. FOLLICLE.
 - N. Fruit dehiscing by two longitudinal sutures, or breaking up by transverse sutures.
 - O. Sutures longitudinal. LEGUME.
 - O. Sutures transverse, the fruit breaking into one-seeded segments. LOMENT.
 - M. Fruit from a two- to many-carpellate gynoeceium.

- P. Fruit with a dry/fibrous to leathery or fleshy outer husk that early to tardily breaks apart; center of fruit with hard "stone(s)" enclosing seed(s).
.DEHISCENT DRUPE.
- P. Fruit lacking hard "stone(s)" enclosing seed(s); splitting open or into one-seeded segments.
 - Q. Fruit splitting into one or few-seeded segments (mericarps).SCHIZOCARP.
 - Q. Fruit splitting open and releasing seeds.
 - R. Fruit two-loculate, the two valves splitting away from a persistent thin partition around the rim of which the seeds are attached.SILIQUE.
 - R. Fruit one- to several-loculate, the partition not persistent if the fruit two-loculate.CAPSULE.
(The more conspicuous kinds are keyed below.)
 - S. Dehiscence circumscissile (splitting transversely), the top coming off like a lid.
. . .CIRCUMSCISSILE CAPSULE (PYXIS).
 - S. Dehiscence not circumscissile.
 - T. Fruit opening by pores, flaps or teeth.
 - U. Fruit opening by pores or flaps (often near the top)PORICIDAL CAPSULE.
 - U. Fruit opening by a series of apical teeth.
. . . DENTICIDAL CAPSULE.
 - T. Fruit opening longitudinally or irregularly.
 - V. Fruit opening irregularly . . .ANOMALICIDAL CAPSULE.
 - V. Fruit opening longitudinally.
 - W. Valves breaking away from the septa (partitions between the locules).
.SEPTIFRAGAL CAPSULE.
 - W. Valves remaining attached to the septa (at least in part).
 - X. Fruit splitting at the septa. . . .
. . . .SEPTICIDAL CAPSULE.

- X. Fruit splitting
between the septa
and into the
locules (chambers)
of the ovary, or
fruit one-locular
. . . LOCULICIDAL
CAPSULE.

Definitions

Achene.

A + small, indehiscent, dry fruit with a thin and close-fitting wall surrounding a single seed. (Including the cypsela.) Examples: Bidens, Ceratophyllum, Clematis, Cyperus, Ficus, Fragaria, Medicago lupulina, Ostrya, Petiveria, Platanus, Psoralea lupinellus, Rhynchospora, Rosa, Rumex, Sagittaria, Trifolium campestre, Vernonia.

Berry.

An indehiscent, fleshy fruit with (one-) few to many seeds. The flesh may be + homogeneous throughout or the outer part may be hard, firm or leathery; septa are present in some, and the seeds may be arillate or with a sarcotesta. (Including the pepo, hesperidium, amphisarca, and balausta.) Examples: Aegle, Annona, Averrhoa, Bumelia, Cananga, Citrus, Cucurbita, Durio, Eugenia, Litchi, Miconia, Musa, Opuntia, Passiflora, Punica, Sabal, Smilax, Solanum, Tamarindus, Theobroma, Vaccinium, Vitis.

Capsule.

A dry to fleshy fruit from a two- to many-carpellate gynoecium which opens (in various ways) to release (one-) few to many seeds. Such fruits may have from one to many locules; if two-loculate then the partition is not persistent. The seeds may be arillate or with a sarcotesta. Examples: Aesculus, Allium, Amaranthus (some), Argemone, Aristolochia, Begonia, Blighia, Campsis, Casearia, Celosia, Clusia, Couroupita, Echinocystis, Epidendrum, Eucalyptus, Euonymous, Geranium, Hibiscus, Ipomoea, Justicia, Lachnanthes, Lagerstroemia, Lecythis, Lyonia, Maytenus, Momordica, Myristica, Oxalis, Pittosporum, Portulaca, Rhododendron, Swietenia, Triodanis, Viola.

- Caryopsis. A + small, indehiscent, dry fruit with a thin wall surrounding and + fused to a single seed (=Grain). Examples: most Gramineae.
- Dehiscent drupe. A fruit with a dry/fibrous to fleshy or leathery outer husk that early to tardily breaks apart exposing one or more nut-like centers enclosing the seed(s). Examples: Carya, Rhamnus (some), Sageretia, Scyphosyce, Streblus.
- Drupe. An indehiscent fleshy fruit in which the outer part is + soft (to occasionally leathery or fibrous) and the center with one or more hard "stones" (pyrenes) enclosing seeds. Examples: Arctostaphylos, Clerodendrum, Cocos, Cordia, Cornus, Ilex, Juglans, Licania, Melia, Metopium, Myrsine, Nectandra, Orbignya, Prunus, Psychotria, Rubus, Scaevola, Terminalia, Trema.
- Early-dehiscent fruit. A Fruit in which the ovary ruptures very early in development (due to the emerging seed or seeds) and subsequently withers. Example: Caulophyllum.
- Follicle. A dry to fleshy fruit derived from a single carpel which opens along a single longitudinal suture. The seeds may be arillate or with a sarcotesta. Examples: Akebia, Alstonia, Aquilegia, Asclepias, Grevillea, Magnolia, Nerium, Paeonia, Sterculia, Tabernaemontana (some), Zanthoxylum.
- Indehiscent Pod. An indehiscent + dry fruit with few to many seeds. Examples: Adansonia, Arachis, Bertholletia, Cassia fistula, Crescentia, Kigelia, Medicago arabica, Thespesia populnea.
- Legume. A dry to fleshy fruit derived from a single carpel which opens along + two longitudinal sutures. The seeds may be arillate or with a sarcotesta. Examples: Abrus, Azalia, Daubentonia, Delonix, Lupinus, Pithecellobium, Tephrosia.
- Loment. A dry to fleshy fruit derived from a single carpel which breaks transversely into one-seeded segments. Examples: Aeschynomene, Desmodium, Sophora.
- Nut. A + large, indehiscent, dry fruit with a thick and bony wall surrounding a single seed. (Including the calybiu.) Examples: Brasenia,

Castanea, Corylus, Dipterocarpus, Nelumbo,
Nothofagus, Quercus, Santalum, Shorea.

Pome.

An indehiscent fleshy fruit in which the outer part is + soft and the center with papery or cartilaginous structures enclosing seeds. Examples: Amelanchier, Crataegus, Pyrus, and most other Maloideae.

Samara.

A winged, indehiscent, + dry fruit containing a single seed. Examples: Ailanthus, Betula, Casuarina, Fraxinus, Liriodendron, Myroxylon, Ptelea, Pterogyne, Stigmaphyllon, Tipuana, Ulmus.

Schizocarp.

A dry to fleshy fruit derived from a two- to many-carpellate gynoecium that splits into one-seeded (or few-seeded) segments (mericarps). If desired, the mericarps may be designated as samara-like, achene-like, drupe-like, etc. Fruits that develop from gynoecia that show postgenital fusion of their apical parts (see Endriss, et al. 1983) are not considered as schizocarps, e. g., Cynanchum (follicles), Sterculia (follicles), Ailanthus (samaras), Simarouba (drupes), Carissa (berries), Pterygota (samaras), see Gandhi & Thomas (1983). Examples: Acer, Apium, Cakile, Cephalanthus, Croton, Diodia, Erodium, Euphorbia, Glandularia, Gouania, Heliconia, Heliotropium, Lycopus, Ochna, Oxypolis, Pavonia, Salvia, Sida.

Silique.

A fruit derived from a two-carpellate gynoecium in which the two valves split away from a persistent partition (around the rim of which the seeds are attached). (Including the Silicle.) Examples: Most Cruciferae, such as: Arabis, Brassica, Lepidium, Warea.

Utricle.

A + small, indehiscent, dry fruit with a thin wall (bladder-like) which is loose and free from a single seed. Examples: Amaranthus (some), Atriplex, Chenopodium, Lemna, Limonium.

Acknowledgements

I wish to thank numerous colleagues and students with whom this subject has been discussed.

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Studies on Mikania (Compositae) - XII

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Study of South American specimens of Mikania has revealed one new species and a change of status for another.

MIKANIA PERSTIPULATA W. Holmes, sp. nov.

Suffrutex volubilis; foliis ovatis, 8-10 x 4-6 cm, apice caudatis, basi subcordatis vel cordatis, marginibus denticulatis; capitulescentiis paniculatis; capitulis ca. 5 mm longis; corollis ca. 3 mm longis, dentibus limbi ovatis, ca. 0.5 mm longis; achenis 2-2.1 mm longis; pappi setis 35-40, ca. 3.5 mm longis, scabridis

Semiwoody twiner. Stems terete, striate, glabrate; internodes 9-14 cm long. Leaves opposite, 8-10 x 4-6 cm; blades ovate, palmately 5 (-7) nerved from the bases, the nerves puberulent primarily near the basal third of the blade; surfaces glabrous, lightly glandular, prominently reticulate, the veinlets exerted from the surface; apices narrowed to a long acumination 1-1.5 cm long; margins denticulate, the teeth 5-10 mm apart; bases cordate to subcordate; petioles 2-3 cm long, lightly crisped-puberulent; opposite petioles connate with an entire-margined, elliptic-ovate stipule-like enation, ca. 2 x 1 cm, the surfaces reticulate. Capitulescence a dense thyse, 10-15 x 4-5 cm. Bracteal leaves similar to cauline leaves, but reduced in size; branchlets terete, puberulent. Heads ca. 5 mm long, sessile in clusters at the tips of the branchlets; exterior bracts lance-ovate, 1-2 mm long, puberulent. Phyllaries ovate, 3-4 mm long, sparingly glandular and puberulent especially on the outermost pair; apices obtuse, puberulent; bases glabrous, slightly swollen. Corolla ca. 3 mm long, lightly glandular, tube ca. 1 mm long, throat funneliform to semicampanulate, ca. 1.5 mm long, teeth ovate, ca. 0.5 mm long. Achenes 2-2.1 mm long, brown with white ribs. Pappus bristles 35-40, ca. 3.5 mm long, white, the margins scabrid.

TYPE: BOLIVIA. Cochabamba, Incachaca, small power station about 80 miles NE of Cochabamba. 17-00 S. 65-30 W, 8000 ft., 16 Aug 1950, W.M.A. Brooke 6717 (BM).

The new species is the only known Bolivian Mikania with a paniculate capitulescence having enlarged stipule-like enations. Mikania leucophylla (Rusby) B.L. Robins. and M. fiebrigii Hieron. are the only other Bolivian Mikania known to have enlarged stipuliform appendages, but both are easily distinguished from the new species by their corymbose capitulescences.

Mikania comparapensis B.L. Robins. appears to be a very similar plant in nature of leaves, stems, and capitulescence. It is, however, a villous plant totally lacking stipuliform appendages.

MIKANIA EURYANTHELA (Malme) W. Holmes, stat. nov.

Mikania laxa DC. var. euryanthea Malme, Svensk. Vet.-Akad.

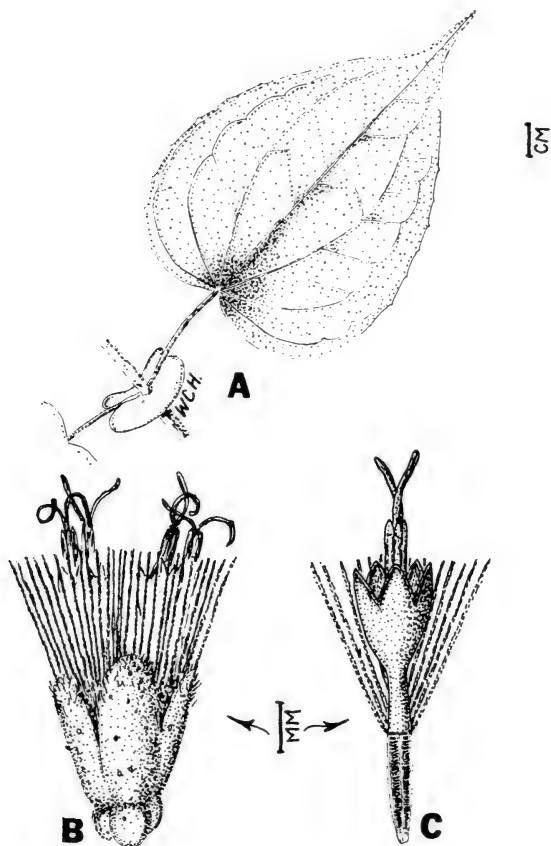
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The name Mikania laxa DC. is considered a synonym of M. angularis H. & B. (Holmes & McDaniel, 1979), a plant distributed in Peru, Ecuador, and Colombia. It is distinguished from M. euryanthela by its leaves which have much more pronounced and pointed basal lobes and achenes with scabrid angles

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Phytologia

41: 183-197



Mikania nerstipulata W. Holmes. A. leaf: B. head: C. flower and achene.

STUDIES IN THE HELIANTHEAE (ASTERACEAE). XXXXI.

A NEW SPECIES OF ASPILIA FROM BRAZIL.

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Two collections have been obtained of an undescribed species of Aspilia from the Serra do Cachimbo in southern Para, Brazil. The species is described here as part of a continuing effort to resolve species concepts in South American members of the genus (Robinson 1984a, 1984b).

Aspilia cachimboensis H. Robinson, sp. nov.

Plantae suffruticosae 2 m altae laxae ramosae. Caules fulvescentes teretes distincte striati scabropilosi et minute hispido-puberuli. Folia opposita, petiolis 5-8 mm longis; laminae oblongae plerumque 9-22 cm longae et 1.5-4.3 cm latae base late rotundatae margine minute serrulatae apice acutae vel minime breviter acuminatae supra et subtus dense scabridae subtus in nervis densius scabridae et in superficiis pallidiores, nervis secundariis pinnatis utrinque ca. 5-8 erecto-patentibus distaliter sensim ascendentiorebus. Inflorescentiae in ramis terminales plerumque unicapitatae, innovationibus lateralibus subfloralibus vegetativis presentibus; pedunculis 5-12 cm longis dense scabridis et puberulis. Capitula ca. 15 mm alta; squamae involucri exteriores ca. 6 foliosae late patentibus 2-3 cm longae et 0.6-0.9 cm latae breviter acutae supra perdense minute scabridulae subtus pallidiores et dense scabrae et scabridulae distaliter sparsius; squamae interiores late oblongae ca. 10 mm longae et 2-5 mm latae apice late irregulariter rotundatae scariosae extus superne minute scabridulo-puberulae; paleae ca. 9.5 mm longae in partibus basilaribus oblongae ca. 7 mm longae et 1.5 mm latae superne non abrupte angustiores, appendicibus apicalibus oblongis ca. 2.5 mm longis et 1.0 mm latis apice anguste rotundatis base ad medio minute puberulis. Flores radii ca. 12-14 in capitulo; corollae flavae, tubis ca. 1.8 mm longis subglabris perdense pilosulis, limbis ca. 14 mm longis et 5 mm latis apice breviter bilobatis in axillis basilaribus fasciculate hispidulis abaxialiter in nervis sparse puberulis. Flores

disci ca. 50 in capitulo; corollae flavae ca. 7.5 mm longae, tubis ca. 0.8 mm longis indistinctis glabris, faucibus ca. 5 mm longis anguste infundibularibus, lobis ca. mm longis et 0.8 mm latis extus sparse scabridulis intus margine et submargine longe papilliferis; filamenta in partibus superioribus ca. 0.3 mm longa; thecae ca. 2.2 mm longae; appendices antherarum pallides ca. 0.6 mm longae et 0.35 mm latae extus glanduliferae. Achaenia immatura 4 mm longa albosetulifera; coronae pappi ad 1 mm longae margine lobatae et setuliferae non aristiferae. Grana pollinis in diametro ca. 30 μ m.

TYPE: BRAZIL: Para: Cuiaba-Santarem road, km 883. Roadside on BR 163. Approx. elev. 260 m. Herb to 2 m; ray flowers orange to red, disc flowers yellow. 14 Feb. 1977. J. H. Kirkbride, Jr. & E. Lleras 2778 (Holotype, UB; isotype, US). PARATYPE: BRAZIL: Para: Northern foothills of Serra do Cachimbo; BR 163, Cuiaba-Santarem highway, km 884; secondary forest by road. Shrub 2 m tall; ray flowers orange-red, disc flowers yellow. 11 Nov. 1977. G. T. Prance, A. S. Silva, M. J. Balick, C. C. Berg, A. J. Henderson, B. W. Nelson, R. P. Bahia, M. R. dos Santos P 25211 (NY, US).

One specimen is labelled as an herb and the other as a shrub, and it is presumed that the plants are subshrubs. The branching is apparently produced belatedly from the bases of terminal peduncles. Also, the species, with its single terminal heads, seems to relate most closely to less shrubby members of the genus. The large, oblong, short-petiolate leaves with pinnate venation are thoroughly distinctive.

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Aspilia cachimboensis H. Robinson, Holotype, Herbario Universidade de Brasília. Photo by Victor E. Krantz, Staff Photographer, National Museum of Natural History,

A NEW SPECIES OF STIFFTIA FROM CAYENNE

(ASTERACEAE: MUTISIEAE)

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A specimen collected in French Guiana has proven to represent a new species in the distinctive Mutisiean genus Stiffitia, the first species of the genus known to occur outside of Brazil. The new species has a large, colored, multiseriate pappus as the most prominent floral feature in the dried plant as is seen in the other three species of the genus. The reddish color of the pappus and viny habit are characters shared with the geographically closest member of the genus, S. uniflora Ducke of northern Amazonas, northern Pará, and Amapa in Brazil. The species is immediately distinguishable by its larger heads with three flowers rather than one flower.

STIFFTIA CAYENNENSIS H. Robinson and B. Kahn, sp. nov.

Plantae volubilis lignosae. Caulis in diametro ad 5-6 cm in corticibus profunditer longitudinaliter fissis in partibus juvenalibus teretes striati appresse pilosuli. Folia alterna, petiolis 1.0-1.2 cm longis; laminae coriaceae obovatae 7-16 cm longae 2.8-3.5 cm latae base cuneatae margine integrae apice breviter late acuminatae supra et subtus glabrae vel sparse pertenuiter arachnoideo-pilosulae, nervis majoribus supra anguste exsculptis subtus exsculptioribus, nervis secundariis paucis inferioribus valde ascendentibus parallelis superioribus sensim brachydromis, nervulis minute reticulatis utrinque prominulis. Inflorescentiae in ramis terminales pyramidaliter thyrsoidae, ramis subtomentellis, pilis base breviter erectis cetera abrupte appresse tenuiter arachnoideis, bracteis inferioribus breviter petiolatis in laminis late ellipticis 8-25 mm longis, bracteis superioribus minutis subulatis 2.5-3.0 mm longis sparse appresse arachnoideo-tomentellis, ramis ultimis plerumque 15-25 mm longis. Capitula ca. 3 cm alta et 1.5 cm lata; squamae involucri brunneo-violaceae 10-12 subimbricatae ca. 3-4-seriatae graduatae ovatae 2-12 mm longae et 1.5-5.0 mm latae apice acutae extus minute striatae glabrae. Flores 3 in capitulo; corollae tubiformes ca. 2 cm

longae glabrae, tubis ca. 11 mm longis, faucibus subnulli, lobis 5 linearibus ca. 9 mm longis ad 0.9 mm latis; thecae ca. 5.5 mm longae in appendicibus basilaribus ca. 1.5 mm longae breviter acuminatae denticulatis non papilloso-fimbriatis; appendices apicales antherarum ovato-lanceolatae ca. 2.5 longae apice vix acuminatae; basi stylorum incrassati; rami stylorum apice rotundati. Achaenia cylindracea ca. 9 mm longa subtomentella, pilis e basi breviter erecti cetera abrupte appresse tenuiter arachnoideis; setae pappi roseae ca. 100 ca. 3-seriatae plerumque 5-20 mm longae apice leniter tenues margine scabridulo-fimbriatae. Grana pollinis prolata ca. 62 μ m longa et 40 μ m lata vix papillata.

TYPE: CAYENNE: Route de Saint Laurent à Paul Isnard entre le PK 70 et Citron au PK 118. Liane atteignant 5-6 cm de \varnothing , écorce crevassee longitudinalement profondément. Feuilles alternes coriaces, glabres. Inflorescence terminale sur les rameaux latéraux; bractées brun violacé, couronne de poils rouges. 7-9-83. G. Cremers 8153 (Holotype, US).

Stiffitia cayennensis differs from the related S. uniflora most obviously by the larger heads with three flowers, but also differs in its basically larger more obovate leaves, its broader achenes with more pubescence that is like that on the peduncles, and by the somewhat shorter pappus bristles. A microscopic difference is seen on the lanceolate basal appendage of the anther thecae which has only low broad teeth. The appendage of S. uniflora is less tapered and is densely fringed with numerous distinct papillae.

The new species is thus far known only from northern French Guiana, but is no farther from some localities of S. uniflora than some of the latter's localities are from each other. Stiffitia uniflora, originally described from the Rio Negro of northern Amazonas in Brazil, has since been collected far to the east in Amapa, and near the border between Amapa and northern Pará. The range of mountains that separates the ranges of the two species seems to provide effective separation primarily by isolating the river drainage patterns of French Guiana from those of the Amazon.

Maguire et al. (1957:388) mention some doubt that Stiffitia uniflora is generically compatible with the other two species of Stiffitia, P. chrysantha Mikan, and S. parviflora D. Don from farther south in Brazil, but they note that the alliance is closer than to other members of the Gochnatinae of the Mutisieae. There seems to be no reason to recognize the two

groups of species as anything more than two subgroups within one genus. The pollen of the new species is basically like that of *S. uniflora*, and lacks the areas of thickened exine described for *S. chrysantha* by Carlquist (1957).

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HERBIER du CENTRE ORSTOM
b.p. 165 - Cayenne - Guinée

n° 8553

date 7-2-83

FAMILLE Sapotaceae

Stiffelia cayennensis

H. Robinson & B. Kahn

nom local

Liane atteignant 7 m de h, écorce crevas-
sée longitudinalement profondément
Feuilles alternes coriaces, glabres
Inflorescence terminale sur les rameaux
latéraux; bractées brun violacées
écorce de poils rouges "poivre de Cayenne"
Date récolte 15/2/83
Route de Saint-Laurent à Paul Tardard
entre le PK 70 et Citron au PK 118

UNITED STATES

3036656

NATIONAL HERBARIUM

Collection G. CHAMBERS Det.

Herbarium of the U.S. National Museum, Washington, D.C.

Stiffelia cayennensis H. Robinson and B. Kahn,
Holotype, United States National Herbarium. Photo by
Victor E. Krantz, Staff Photographer, National Museum
of Natural History.

NEW SPECIES OF VERNONIA FROM BOLIVIA AND PERU

(VERNONIEAE: ASTERACEAE)

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The following two new species have been discovered in undetermined material of Asteraceae from Bolivia and Peru.

Vernonia fournetii H. Robinson and B. Kahn, sp. nov.

Plantae suffrutescentes ad 1 m altae laxae ramosae. Caules pentangulares dense breviter hirtelli et tomentelli. Folia alterna, petiolis brevibus ca. 8-10 mm longis; laminae oblongo-ellipticae 10-12 cm longae et 1.4-3.5 cm latae base rotundatae margine integrae vix recurvatae apice breviter acutae supra et subtus strigosae in nervis prominentibus dense sericeae, nervis secundariis pinnatis utrinque ca. 12 patentibus sensim ascendentiter arcuatis. Inflorescentiae abrupte late scorpioideae cymosae bracteiferae; bractee foliiformes sed minores 10-40 mm longae et 6-14 mm latae. Capitula in axillis bractorum solitaria sessilia ca. 12 mm alta; squamae involucri ca. 30-35 subimbricatae ca. 4-seriatae graduatae oblongo-ovatae vel oblongo-lanceolatae 1-5 mm longae et 1.0-1.5 mm latae apice late vel anguste rotundatae planae extus dense sericeae vel subtomentellae. Flores 20-25 in capitulo. Corollae lavandulae ca. 10 mm longae leniter carnosae extus glabrae, tubis 4.5 mm longis infundibularibus, faucibus 0.75 mm longis, lobis linearibus ca. 4.75 mm longis et 0.7 mm latis apice extus minime armatis; filamenta in partibus inferioribus reflexa superioribus ca. 0.7 mm longa; thecae 4.1-4.2 mm longae; appendices antherarum lavandulae acutae 0.9-1.0 mm longae et 0.25 mm latae glabrae; basi stylorum disciformes noduliferi; scapi stylorum in partibus hispidulis superioribus ca. 0.7 mm longi; rami stylorum ca. 3 mm longi. Achaenia ca. 1.8 mm longa dense sericeo-setulifera base glandulifera; carpodia turbinata ca. 0.3 mm alta et 0.5 mm lata; setae pappi albae subdeciduae ca. 37 plerumque 6.0-6.5 mm longae apice leniter latiores in sereibus exterioribus palaceae ad 1 mm longae et 0.2 mm latae. Grana pollinis in diametro ca. 55-60 μ m valde lophor-

ata, cristis altis minute multo spiculiferis, spinis majoribus nullis, reticulatis a *V. geminatis* similis.

TYPE: BOLIVIA: La Paz: Route de Coroico, km 64, alt. 2650 m. Herbacée de 1 m de haut en buisson. Feuilles alternes de 10-12 cm de long, acuminées, pétiole de 8-10 mm de long. Fleurs mauves en racème, cauliflores. 2/8/1984. *A. Fournet* A. F. 429 (Holotype, US; isotype, IBBA)

The new species apparently belongs to the *Vernonia salzmännii* alliance on the basis of the cymose bractiferous inflorescence and the pollen. The new species differs from *V. salzmännii* DC. by the blunter, less numerous involucre bracts and the much more densely pubescent stems and involucre. Actually, the new species is most obviously distinct by the more abrupt differentiation of the inflorescence. Perhaps the closest relationship of *V. fournetii* is to *V. tarijensis* (Griseb.) Hieron. of northern Argentina, but the latter has more tapered narrowly acute leaves and has narrowly acute, lanceolate involucral bracts.

***Vernonia sandemanii* H. Robinson and B. Kahn, sp. nov.**

Plantae fruticosae ad 3.3 m altae. Caules brunnescentes teretes striati vix angulati appresse irregulariter pilosuli et sparse glandulo-punctati. Folia alterna, petiolis 1-3 mm longis; laminae papyraceae ellipticae plerumque 7-9 cm longae et 1.5-2.7 cm latae base late cuneatae margine superne sensim breviter serratae apice breviter acuminatae supra nitidae plerumque sparse pilosulae in nervis primariis densius pilosulae in nervis et nervulis insculptae subtus breviter luteo-sericeae inter nervos et nervules majores vadosae appresse albo-tomentosae, nervis secundariis pinnatis utrinque 5-6 valde ascendentibus. Inflorescentiae in ramis terminales laxae ramosae in ramis dense corymbosae in ramulis dense glomerulae, ramis dense luteo-sericeis, bracteis foliaceis solum in nodis primariis inferioribus presentibus. Capitula in glomerulis sessilia cylindracea 10-12 mm alta et 2-3 mm lata; squamae involucri ca. 15 imbricatae ca. 4-5-seriatae valde inaequales 1.5-5.0 mm longae et ca. 1 mm latae apice generaliter rotundatae sed in maturitatis eroso-fissae extus in partibus non imbricatis purpureae, squamae exteriores ovatae extus subtomentellae, squamae interiores facile deciduae lineares vel anguste ellipticae extus plerumque glabrae superne leniter appresse puberulae. Flores 1 in capitulo. Corollae violaceae ca. 8 mm longae, tubis anguste cylindraceutis 3.5-4.0 mm longis extus breviter stipitato-glanduliferis, faucibus nullis, lobis 5 profunde divisis linearibus 4.0-4.5 mm

longis et 0.7 mm latis extus apice in aggregis discretis dense glanduliferis caetera persparse glandulo-punctatis; filamenta in parte superiore ca. 0.6 mm longa; thecae ca. 1.3 mm longae base papilloso-fimbriatae; appendices apicales antherarum oblongae ca. 0.5 mm longae et 0.27 mm latae apice rotundatae glabrae; nodi stylorum distincti breviter cylindracei; scapi stylorum in partibus superioribus hispidulis 0.5-1.0 mm longi, pili apice rotundati. Achaenia submatura ca. 2 mm longa distincte 10-costata in costis breviter setulifera inter costas glandulo-punctatis; carpodia breviter subcylindrica ca. 0.1 mm alta et 0.4 mm lata; setae pappi persistentes albae ca. 65 plerumque ca. 7 mm longae et apice anguste clavatae, setae paucae exteriores breviores et apice tenuiores. Grana pollinis in diametro ca. 45 μ m irregulariter areolata et spinulosa (Lynchophora-type).

TYPE; PERU: Huanuco: Carpish (above Huanuco), the rain forest, growing in semi-shade. Alt. 8500 ft. 8-10 ft. shrub with bright-heliotrope flowers. June 1938. C. Sandeman 219 (Holotype BM).

The new species seems most closely related to Vernonia flexipappa Gleason of southern Ecuador and to Eremanthus jelskii Hieron. of northern Peru which has recently been renamed as V. shanynensis by MacLeish (1984). All have single-flowered heads. The three species superficially resemble Critoniopsis which has few-flowered heads with easily deciduous inner involucre bracts (Robinson 1980), but they differ by the lobes of the corolla being divided to the base of the throat and by the achenes being distinctly 10-ribbed with glands and setulae. The blunt hairs of the style branches are also like the subtribe Piptocarphinae to which Critoniopsis belongs (Robinson et al. 1980), but the achenes are not smooth and nearly glabrous as in members of that subtribe. The present group seems to hold a relationship to Critoniopsis similar to that of another northern Andean group noted by Robinson (1980). The latter group contains V. crassilanata Cuatr., V. neogleasoniana Cuatr., V. sparrei H. Robinson, and V. trichotoma, having corollas deeply lobed like in the present group but with more numerous flowers in the heads and with opposite leaves.

Vernonia sandemanii is like the Ecuadorian V. flexipappa in the more congested pappus with distinctly more than one row of long setae and with the lower leaf surfaces thinly pale-tomentose and yellowish pilose. The Ecuadorian species differs by the pale involucre bracts and the leaves broadest at or below the middle with less toothed often narrowly

recurved margins and less prominent veins on the lower surface. *Vernonia shaynensis* is a more densely leaved shrub with denser, more abrupt inflorescences, more shortly petiolate leaves with somewhat recurved margins, more sharply pointed involucre bracts, and with the pappus less congested and scarcely more than uniseriate.

The new species helps clarify the nature of a small group distributed from southern Ecuador to central Peru which had previously been known from only two species that were not recognized as close relatives of each other.

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219

FLORA OF Peru

No.

Name

Vern. Name

Locality San José de CuzcoDate 1935 Altitude 12,000 ft.Coll. Robinson & KahnHabitat High mountainDescription, etc. Small plantDescription, etc. Small plant

Economics

Vernonia sandemanii H. Robinson & B. Kahn,
Holotype, British Museum (Natural History).

STUDIES IN THE EUPATORIEAE (ASTERACEAE). CCXXI.

ADDITIONAL SPECIES FROM TROPICAL AMERICA.

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Specimens sent on loan and materials sent for identification continue to furnish examples of species that are undescribed or in need of transfer to other genera. The present paper offers descriptions of two species in each of Ageratina, Critonia, and Neomirandea, and a single species of Mikania. Also necessary is the following new combination in Ophryosporus.

Ophryosporus heptanthus (Sch.Bip. ex Wedd.) R. M. King & H. Robinson, comb. nov. Basionym, Eupatorium organoides Meyen & Walp., Nov. Act. Acad. Caes.-Leopold 19, suppl. 1: 257. 1843, not E. organoides Humboldt, Bonpland & Kunth, 1818 (now Cronquistianthus). Syn. Ophryosporus organoides Hieron., Bot. Jahrb. 22: 707. 1897.

When B. L. Robinson (1920: 27) placed Eupatorium heptanthum Sch. Bip. ex Wedd. in synonymy, he overlooked the fact that the common Meyen and Walpers name was a later homonym. The latter name was validated at the time of its transfer into Ophryosporus in 1897, but that was long after the date of validation of the synonym.

Ageratina contigua R. M. King & H. Robinson, sp. nov.
Plantae fruticulosae 1.0-1.2 m altae laxae ramosae. Caules fulvescentes teretes vel subhexagonales glabri. Folia opposita sessilia; laminae anguste oblongo-lanceolatae 2.7-11.1 cm longae et 0.6-6.6 cm latae base truncato-rotundatae subamplexicaules margine supra basem crenato-serrulatae apice anguste acutae supra glabrae subtus in nervulis sparse appresse pilosulae, nervis secundariis inferioribus pinnatus brevioribus congestioribus patentioribus supra mediam ascenduntioribus et remotioribus, nervulis translucetiter pellucido-reticulatis. Inflorescentiae in ramis terminales in axillis inferioribus foliiferae corymboso-paniculatae, ramis et ramulis tenuibus

puberulis, ramulis ultimis 5.5-9.0 mm longis. Capitula ca. 8 mm alta et madida 2-3 mm lata; squamae involucri pallide virides ca. 12 eximbricatae plerumque ca. 5 mm longae et 0.75 mm latae exteriores breviores 3-4 mm longae omnino anguste acutae extus supra basem glabrae distincte bicostatae. Flores ca. 6 in capitulo; corollae albae ca. 5 mm longae, tubis tenuibus ca. 2 mm longis glabris, faucibus anguste campanulatis ca. 2.5 mm longis glabris, lobis triangularibus ca. 0.9 mm longis et 0.6 mm latis extus pauce puberulis; filamenta in parte superiore ca. 0.35 mm longa; thecae ca. 1.2 mm longae; appendices antherarum ca. 0.25 mm longae et 0.15 mm latae; rami stylum interne glanduliferi; achaenia 1.5-1.8 mm longa aliquantum fusiformia superne et in costis breviter setulifera; carpopodia breviter cylindrica ca. 0.12 mm lata et 0.23 mm lata, cellulis elongatis; setae pappi ca. 20 facile deciduae plerumque 4.0-4.5 mm longae. Grana pollinis in diametro ca. 27 μ m.

TYPE: COSTA RICA: Puntarenas: Cordillera de Talamanca, 1-3 airline km S of the peak of Cerro Echandi; 9°00'30"-9°01'30" N, 82°49' W; elev. 2500-2800 m. Quercus forest with Chusquea understory. Shrub 1 - 1 1/2 m tall; florets white. 9 Mar. 1984. G. Davidse, I. D. Gómez, G. Herrera, C. R. Chacón, I. & A. Chacón 25504 (Holotype MO).

The species has a superficial resemblance to the poorly known Ageratina tonduzii (Klatt) K. & R. of Costa Rica but is thoroughly distinct by the sessile leaves and slender pedicels and involucre bracts of the inflorescence. The species is distinct from its relatives and unusual in the subgenus by the few flowers in its heads, the sparse hairs on its corolla lobes, the shortness of its carpopodium, and by the series of small glands on the inner surface of the style branches. The latter have thin-walled basal cells and thicker-walled terminal cells.

Ageratina (Neogreenella) breedlovei R. M. King and H. Robinson, sp. nov.

Plantae fruticosae ca. 1.3 m altae laxae ramosae. Caules brunnescentes teretes leniter striati glabri. Folia opposita, petiolis 4-9 mm longis; laminae ovato-lanceolatae 5.5-8.5 cm longae et 1.3-3.0 cm latae base obtusae vel subrotundatae margine dense minute serrulatae apice anguste acutae supra et subtus glabrae, nervis primariis subtus valde prominentibus, nervis secundariis pinnatis vix prominulis numerosis, nervulis translucentiter pellucido-reticulatis. Inflorescentiae in ramis terminales in nodis inferioribus foliiferae thyrsoidae-paniculatae, ramis corymbosis

glabris, ramulis ultimis 3-7 mm longis. Capitula ca. 13 mm alta et 3-4 mm lata; squamae involucri rubescentes ca. 10 eximbricatae longiores lineares ad 7.5 mm longae et 1 mm latae exteriores breviores 1-2 lanceolatae ca. 2 mm longae omnino apice denticulatae et breiter apiculatae extus multo minute glandulo-punctatae. Flores ca. 8 in capitulo; corollae pallidae distaliter lavandulae anguste infundibulares ca. 7.3 mm longae extus glabrae, tubis angustioribus ca. 2.5 mm longis, faucibus ca. 2.5 mm longis, lobis ca. 0.9 mm longis et 0.6 mm latis; filamenta in parte superiore ca. 0.5 mm longa; thecae ca. 2.4 mm longae; appendices antherarum 0.45 mm longae et 0.25 mm latae; rami stylorum non glanduliferi; achaenia ca. 2.5 mm longa superne setulifera inferne in costis scabridulae; carpodia breviter rotundata ca. 0.1 mm alta et 0.25 mm lata, cellulis quadratis; setae pappi ca. 40 pallide rufescentes plerumque 5.0-5.5 mm longae et in apicem vix vel non latiores, setae interspersae 1-3 mm breviores et distaliter tenuiores. Grana pollinis in diametro ca. 27 μ m.

TYPE; MEXICO: Guerrero: 1-3 km northwest of Puerto El Gallo, ridge with forest of Pinus, Quercus, Ostrya and Carpinus, elev. 2500-2750 m. Shrub 4 feet tall, flowers lavender. 11 Nov. 1973. D. E. Breedlove 36067 (Holotype CAS).

The new species is distinguished by the pinnately veined, non-glanduliferous leaves with pellucid veins. Closest resemblance and possible closest relationship is to A. cronquistii K. & R., but the latter has more narrowly acuminate, glanduliferous leaves that are distinctly trinervate at the base of the blade. On the basis of the leaf and inflorescence shape the relationship to the pinnately veined A. ligustrina (DC.) K. & R. is much more remote.

Critonia breedlovei R. M. King & H. Robinson, sp. nov.

Plantae fruticosa 5 m altae laxae ramosae. Caules fulescentes hexagonales glabri. Folia opposita, petiolis 1.3-1.5 cm longis; laminae ovato-lanceolatae 13.0-19.2 cm longae et 4.5-5.2 cm latae base acutae margine serrulatae apice anguste leniter acuminate supra et subtus glabrae interne distincte pellucide punctatae et lineatae, nervis secundariis pinnatis utrinque ca. 9. Inflorescentiae in ramis terminales pyramidaliter paniculatae, ramis sparse appresse puberulis. Capitula in fasciculis sessilia cylindrica ca. 8 mm alta et 3 mm lata; squamae involucri ca. 18 appresse subimbricatae ca. 5-seriatae valde inaequilongae 1.5-4.5 mm longae et 1.0-2.0 mm latae ovatae vel oblongae apice breviter obtusae vel rotun-

datae extus glabrae leniter ca. 4-striatae. Flores 5 in capitulo; corollae albae ca. 4 mm longae leniter infundibulares glabrae vel in faucibus persparse glanduliferae, tubis ca. 1.7 mm longis, faucibus ca. 1.7 mm longis, lobis ca. 0.45-0.50 mm longis et latis; filamenta in parte superiore ca. 0.18 mm longa; thecae ca. 1.2 mm longae; appendices antherarum ca. 0.25 mm longae et 0.23 mm latae; appendices stylorum distaliter leniter latiores; achaenia ca. 3.25 mm longa base angusta in costis inferne et superne minute scabridula inter costas glabra; setae pappi ca. 30 ca. 3.3 mm longae apice latiores, cellulis apicalibus brevibus densioribus. Grana pollinis in diametro ca. 20 μ m minute asperula.

TYPE: MEXICO: Chiapas: From Chicharras, alt. 3000-6000 ft. Feb. 6, 1896. E. W. Nelson 3753 (Holotype US). PARATYPES: MEXICO: Chiapas: Volcan Tacana, Chiquihuite. 2800 m. 27 Mar. 1939. E. Matuda 2822 (US); Siltepec, 3 Jan. 1937. E. Matuda 850 (US); Municipio of Jitotol, Pueblo Nuevo Solistahuacán, 5 miles south of Jitotol. Elev. 5600 feet. Slope with Pinus and Liquidamber along road. Shrub 15 feet tall, flowers white (CAS); Municipio of Villa Corzo, east base of Cerro Tres Picos near Cerro Bola along a logging road southwest of Colonia Agronomos Mexicanos. Steep slopes with Pinus, Quercus and Liquidamber and montane rain forest. Elev. 1500 m. Shrub 15 feet tall, flowers lavender. 9 Feb. 1972. D. E. Breedlove 24106 (CAS); Municipio of Motozintla de Mendoza, 45-50 km northeast of Huixtla along road to Motozintla, steep slopes with montane rain forest, Oecopetalum, Magnolia, Wimmeria, and Podocarpus. Elev. 1900 m. Shrub, flowers white. 17 Nov. 1971. D. E. Breedlove & A. R. Smith 22615 (CAS); Tree 20 feet tall. 28 Dec. 1972. D. E. Breedlove & R. F. Thorne 31003 (CAS); Southwest side of Cerro Mazotal, 11 km northwest of the junction of the road to Motozintla along the road to El Porvenir and Siltepec. Steep canyon, montane rain forest with Oecopetalum, Magnolia, Clethra, Pinus, Quercus and Symplocos. Elev. 2100 m. Shrub 15 feet tall, flowers white. 21 Nov. 1976. D. E. Breedlove 41607 (CAS).

The new species is one of two described here that have been placed under a broad concept of Critonia hospitalis (B. L. Robinson) K. & R., a species that appears to be restricted to near its type locality near Orizaba in Veracruz. Of the two new species, C. breedlovei is more like C. hospitalis in the form of its corollas but distinct in the short pubescence of its achenes. The species differs from the following by more hexagonal stems, the leaves with more narrowly

acuminate tips, and the more funnelform corollas.

Critonia tuxtlae R. M. King & H. Robinson, sp. nov.

Plantae fruticulosae 3-5 m altae laxae ramosae. Caules fulvescentes teretes vel subhexagonales glabri. Folia opposita, petiolis 8-14 mm longis; laminae ellipticae vel elliptico-lanceolatae plerumque 8-12 cm longae et 3.0-4.5 cm latae base leniter breviter acuminatae margine undulato-mucronatae vel serrulatae apice leniter breviter acuminatae supra et subtus glabrae interne distincte pellucide punctatae et lineatae, nervis secundariis pinnatis utrinque 6-7. Inflorescentiae in ramis terminales pyramidaliter paniculatae, ramis glabris. Capitula in fasciculis sessilia cylindrica ca. 7 mm alta et 3 mm lata; squamae involucris 15-19 appresse subimbricatae ca. 5-seriatae valde inaequilongae 1-5 mm longae et 0.8-1.5 mm latae ovatae vel oblongae apice obtusae vel rotundatae extus glabrae leniter ca. 4-striatae. Flores 5 in capitulo; corollae albae ca. 3.5 mm longae breviter tubiformes glabrae, tubis ca. 1.5 mm longis, faucibus 1.2 mm longis, lobis ca. 0.8 mm longis et 0.5 mm latis; filamenta in parte superiore ca. 0.2 mm longa; thecae ca. 1.2 mm longae; appendices antherarum ca. 1.5 mm longae et 1.8 mm latae; appendices stylorum distaliter leniter latiores; achaenia ca. 3 mm longa base angusta in superficiis lateralibus et in costis longe setuliferis, setulis multicellularis; setae pappi ca. 28 plerumque ca. 3 mm longae et in apicibus aliquantum clavatae, setae ceterae breviores 1.0-1.5 mm longae et in apicibus tenuiores. Grana pollinis in diametro ca. 22 μ m minute asperula.

TYPE: MEXICO: Chiapas: 11 road miles north of Tuxtla Gutierrez, at Sumidero, overlooking the limestone canyon of the Rio Mescalapa. In second-growth forest in tropical oak-forest zone. Elev. about 4500 feet. Arborescent shrubs about 4 m tall, flowers white. Nov. 5, 1965. A. Cronquist & M. Sousa 10499 (Holotype US). PARATYPES: MEXICO: Chiapas: Cerro Mactumutza, Tuxtla Gutierrez. 1 Jan. 1949. I. K. Langman 3818 (US); Al N. de Tuxtla Gutierrez, en selva baja caducifolia, hacia 800 m. Arbusto & arbolito 3-4 m. 18 Nov. 1949. F. Miranda 5734 (US); Cerro Hueco, al S.E. de Tuxtla Gutierrez, en selva mediana subcaducifolia, hacia 850 m. Arbolito de unos 5 m. 4 Feb. 1951. F. Miranda 6877 (US).

Of the two new species, C. tuxtlae seems nearer to C. hospitalis in having dense pubescence on its achenes, but it differs by longer lobes of the corolla, the shorter thicker pappus setae, and the shorter appendage of the anther. The setulae of the

achenes are actually different in their detailed structure, being longer with a number of cells in each row. The new species is possibly nearer to C. nicaraguensis (B. L. Robinson) K. & R., but the latter has very slender corollas with narrow lobes, narrow achenes, and narrower pappus setae. The setulae are concentrated in the upper part of the achenes, and they are shorter with fewer cells.

Mikania platylepis D. Don ex R. M. King & H. Robinson, sp. nov.

Plantae volubilis vix lignosae. Caules virides vel pallide brunnescentes hexagonales dense minute hispiduli. Folia opposita, petiolis 10-15 mm longis; laminae late ellipticae plerumque 6.5-9.5 cm longae et 5.2-6.2 cm latae base generaliter late rotundatae et in medio breviter acuminatae margine integrae apice breviter late acuminatae supra minute scabridulae et sparse glandulo-punctatae subtus dense hispidotomentellae et multo glandulo-punctatae, nervis secundariis utrinque 3-4 pinnatis patentibus arcuatis sensim ascendentibus et conniventibus camptodromis. Inflorescentiae in ramis secundariis et ramulis axillaribus terminales corymbosae, ramis dense breviter hispidulis, bracteis in nodis inferioribus foliiformibus in laminis 3.0-4.5 cm longis et 2.2-3.0 cm latis. Capitula in fasciculo ultimo triplices sessilia ca. 11 mm alta 4-5 mm lata; squamae subinvolutrales minute subulatae ca. 1.0-1.5 mm longae; squamae involucri 4 pallide-virides subaequales oblongae 6-7 mm longae et 3 mm latae apice late rotundatae vel subtruncatae extus ca. 10-striatae superne sensim dense breviter hispidulae. Flores 4 in capitulo; corollae albae? ca. 6 mm longae extus glandulo-punctatae et minute puberulae, tubis 1.0-1.3 mm longis, faucibus leniter infundibularibus ca. 2 mm longis, lobis 5 ca. 2.0-2.2 mm longis ca. 1 mm latis; filamenta in parte superiore ca. 0.2 mm longa inferne 0.22-0.25 mm lata; thecae ca. 2.5 mm longae; appendices antherarum ca. 0.8 mm longae et base ca. 0.3 mm latae; scapi stylorum supra basem sparse stipitato-glanduliferi; appendices stylorum dense hispidulae. Achaenia ca. 5 mm longa 5-costata sparse glandulo-punctata minute puberula superne densiores; setae pappi rufescentes ca. 55 plerumque 6.0-6.5 mm longae plerumque leniter clavatae, cellulis distalibus apice rotundatis. Grana pollinis in diametro ca. 23 μ m breviter spinulosa.

TYPE: PERU: without definite locality. Ruiz & Pavon s/n (Holotype and paratype BM).

The new species, even though collected by Ruiz

and Pavon almost 200 years ago and given a herbarium name by D. Don over 150 years ago, seems totally undescribed. It is not represented in either of the significant treatments of Mikania for Peru (B. L. Robinson 1922; Holmes & McDaniel 1982). There seems to be no reason not to validate the D. Don name, M. platylepis, which evidently refers to the distinctive broadly oblong involucre bracts. The new species has the triplets of sessile heads, pubescence on the style shaft, and dense, very long papillosity of the style appendages that are characteristic of the Mikania guaco relationship which seems particularly well-developed in Peru. The species seems closest to M. speciosa DC. on the basis of the corolla lobes being longer than the throat, but the latter has an even shorter throat, has narrower involucre bracts like most of the genus, and has slender rather than clavate tips on the reddish pappus bristles.

***Neomirandea tenuipes* R. M. King & H. Robinson, sp. nov.**

Plantae fruticosae epiphyticae subcarnosae dense ramosae. Caules brunnescentes teretes dense verrucosi. Folia opposita subcarnosa glabra, petiolis subnullis ad 1 mm longis; laminae anguste rhomboideae plerumque 1.7-2.8 cm longae et 0.4-0.8 cm latae base cuneatae margine superne utrinque 3-4-serratae in parte anguste recurvatae apice breviter anguste acutae supra virides subtus pallidiores dense immerse glandulo-punctatae, nervis primariis laevibus, nervis secundariis indistinctis. Inflorescentiae in ramis terminales in axillis terminalibus fasciculate aggregatae, pedunculis tenuibus plerumque non ramosae 8-20 mm longae dense minute verrucose puberulae. Capitula ca. 8 mm alta et 5-6 mm lata; squamae involucri exteriores breviores 8-10 erecto-patentes vel patentes oblongae vel ovatae plerumque 2-4 mm longae et 1.0-1.5 mm latae apice obtusae extus prominentiter dense glandulo-punctatae; bracteae interiores 9-10 erectae lineares 6-7 mm longae et ca. 0.7-0.8 mm latae lavandulo-tinctae apice rotundatae subapice paucae glandulo-punctatae. Flores 9-10 in capitulo; corollae albae vel lavandulae anguste infundibulares 3.5-4.0 mm longae; tubis ca. 1.3 mm longis sparse glandulo-punctatae, faucibus ca. 1.6 mm longis, cellulis quadratis in parietibus non sinuosis, lobis ovatis ca. 0.5-0.6 mm longis et 0.5 mm latis extus superne perdense glandulo-punctatis inferne glabris; filamenta in parte superiore ca. 0.35 mm longa; thecae ca. 0.5 mm longae; appendices antherarum ca. 0.1 mm longae et 0.2 mm latae; achaenia ca. 2 mm longa subglabra apice

minime minute spiculifera base anguste stipitata; carpopodia minuta, cellulis 2-3-seriatis quadratis in parietibus non incrassatis; setae pappi ca. 46-48 plerumque 3.0-3.5 mm longae tenues apice leniter clavatae, setae paucae ceterae irregulariter breviores et apice tenuiores. Grana pollinis in diametro ca. 22 um breviter spinulosa.

TYPE: PANAMA: Border of Chiriqui and Bocas del Toro Prov.: Cerro Colorado; road to Bocas del Toro; end of mountain access road, just above face of mine; 1600-1700 m alt. Epiphytic small shrub; flowers pink in sun, white in shade. 14 August 1977. J. P. Folsom G. Small & R. Robbins 4768 (Holotype US; isotype MO).

The new species seems to be the most distinctive of those in the N. eximia (B.L.Robinson) K. & R. relationship. The branching is unusually dense and the leaves have the most marked serrations in the group. More distinctive, however, are the inflorescences with long, slender, mostly unbranched peduncles clustered at the ends of the leafy branches, and the well-developed involucre bracts with differentiated broad spreading outer members and erect narrow inner members. A further difference from N. eximia itself is the presence of glands in the tips of the corolla lobes. Neomirandea gracilis K. & R., also from Bocas del Toro, is a member of the relationship having remotely serrulate leaves and glands on the corolla lobes, but the latter is like N. eximia in the form of its inflorescence and its involucre, and it has the glands spread over the whole surface of the lobes and upper throat of its corollas.

The name of the species refers to the slender peduncles of the heads, but would also be appropriate for the stipitate bases of the achenes.

Neomirandea ternata R. M. King & H. Robinson, sp. nov.

Plantae fruticosae terrestres? et epiphyticae subcarnosae. Caules teretes valde evanescentiter puberuli. Folia ternate verticillata glabra, petiolis 7-9 mm longis; laminae obovatae plerumque 4-10 cm longae et 1.5-4.2 cm latae margine superne minime denticulatae apice breviter acuminatae subtus dense glandulo-punctatae, nervis secundariis pinnatis utrinque 6-7. Inflorescentiae in ramis terminales late corymbosae ca. 25 cm longae et latae, ramis ultimis 4-10 mm longis puberulis. Capitula ca. 8 mm alta; squamae involucri 9-10 lineari-lanceolatae inaequales 2.5-4.5 mm longae et ca. 1 mm latae extus puberulae et sparse glandulo-punctatae. Flores 5 in capitulo; corollae lavandulae anguste infundibulares ca. 5.25 mm longae intus glabrae in lobis et superne in faucibus

puberulae, tubis 3 mm longis, faucibus 1.5 mm longis, cellulis late oblongis, parietibus non sinuosis, lobis ca. 0.6 mm longis et 0.5 mm latis extus 1-3-glandulopunctatis; filamenta in parte superiore ca. 0.4 mm longa; thecae ca. 1.2 mm longae; appendices antherarum ca. 0.2 mm longae et 0.17 mm latae; achaenia 3.0-3.3 mm longa base et apice in costis scabrida superne puberula base carnose prolongata; carpodia brevia, cellulis subquadratis 3-4-seriatis; setae pappi ca. 45 plerumque ca. 5 mm longae aliquot distincte breves 0.2-0.4 mm longae, longiores tenues minute scabridae apice vix latiores. Grana pollinis in diametro ca. 25 μ m breviter spinulosa.

TYPE: PANAMA: Chiriqui: Fortuna Dam area, along Quebrada Bonito to E of Road. Alt. 1100 m; 8°45' N, 82°13' W. Terrestrial and epiphytic shrub; flowers lavender. 8 Feb. 1984. H. W. Churchill, G. de Nevers & H. Stockwell 4734 (Holotype US).

The new species seems to combine traits of Neomirandea croatii K. & R. of Panama and N. costaricensis K. & R. of the Cerro de la Muerte in Costa Rica. The corollas have extensive pubescence as in the former but the leaves are glabrous, the stems only puberulous, and the leaves are ternate. The ternate leaves are like the Costa Rican species, but the corollas are more pubescent, and the leaves are larger and broader. The short setae of the pappus are rather obvious and may prove distinctive.

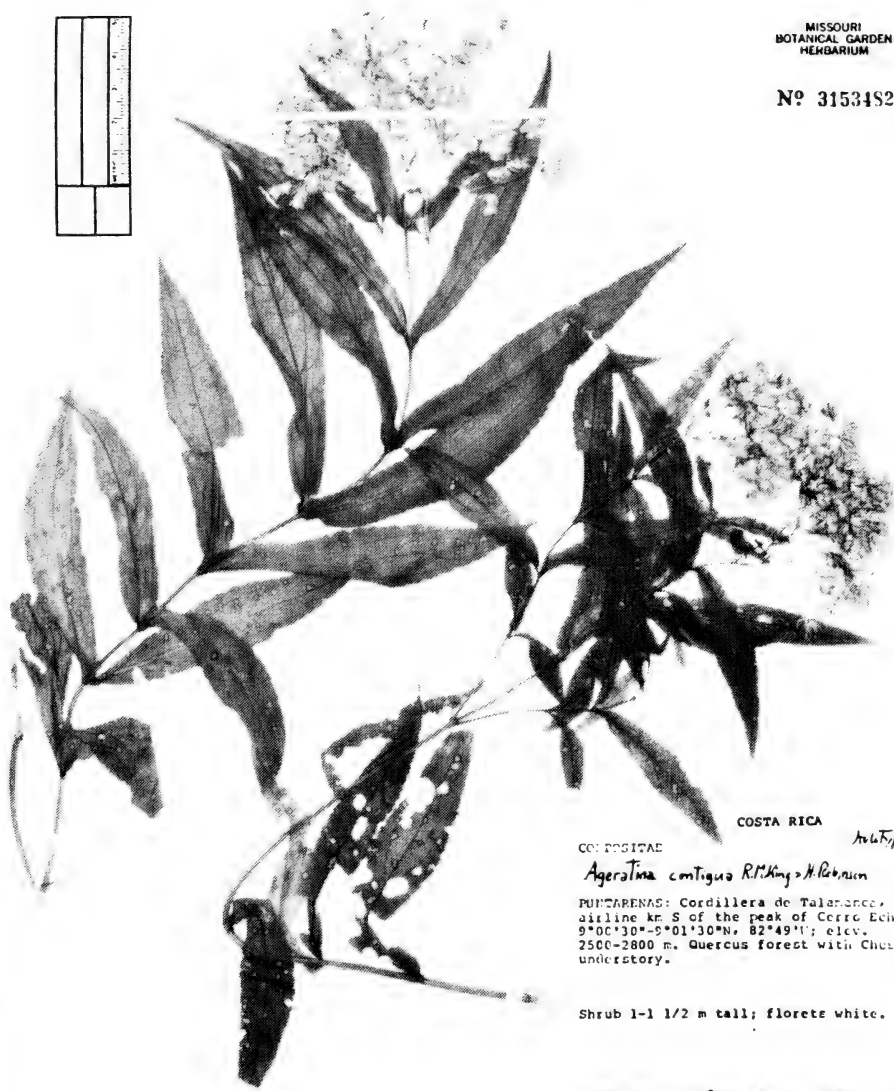
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- Robinson, B. L. 1920. Further diagnoses and notes on tropical American Eupatorieae. Contrib. Gray Herb. n.s. 61: 3-30.
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MISSOURI
BOTANICAL GARDEN
HERBARIUM

Nº 3153492



COSTA RICA

holotype

COMPOSITAE

Ageratina contigua R.M. King & H. Robinson

PUNTARENAS: Cordillera de Talamanca, 1-3
airline km. S of the peak of Cerro Echandi
9°06'30"-9°01'30"N, 82°49'W; elev.
2500-2800 m. Quercus forest with Cheques
understory.

Shrub 1-1 1/2 m tall; florets white.

G. Davidse, L. D. Gómez, 9 Mar. 1984
G. Herrera, C. R. Chacón, L. A. Chacón 2550
MISSOURI BOTANICAL GARDEN HERBARIUM (MO)

Ageratina contigua R. M. King and H. Robinson,
Holotype, Missouri Botanical Garden, St. Louis.
Photos by Victor E. Krantz, Staff Photographer,
National Museum of Natural History.



UNITED STATES NATIONAL HERBARIUM

Ageratina breedlovei R. King & H. Robinson

det. R. M. King and H. Robinson

Holotype

PLANTS OF MEXICO
ESTADO DE GUERRERO

Eupatorium sp.
(det. T. McVaugh '76-77)

Flowers lavender. Shrub 4 feet tall.
Ridge with forest of *Pinus*, *Quercus*,
Ostrya and *Carpinus* 1 - 3 km northwest
of Puerto El Gallo.

Elevation 2500 - 2750 m

D. E. Breedlove 36067 11 November 1973

Ageratina breedlovei R. M. King and H. Robinson,
Holotype, California Academy of Sciences.



Critonia breedlovei R. M. King and H. Robinson,
Holotype, United States National Herbarium.



UNITED STATES

2586458 A

NATIONAL HERBARIUM

Critonia tuxtlae McKay & H. Robinson
 Holotype

HERBARIUM OF
 THE NEW YORK BOTANICAL GARDEN

Plants of MEXICO

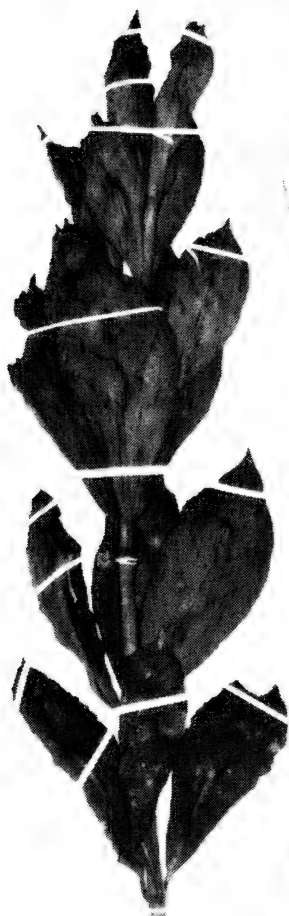
Eupatorium hospitale Robins.

CHIAPAS: In second-growth forest in tropical oak-forest zone at El Sumidero, overlooking the limestone canyon of the Rio Mescalapa, 11 road miles north of Tuxtla Outierres. Elevation about 4500 feet.

Arborescent shrubs about 4 m. tall. Flowers white.

Arthur Cronquist and
 Mario Sousa 10,99 November 5, 1965

Critonia tuxtlae R. M. King and H. Robinson,
 Holotype, United States National Herbarium.



UNITED STATES

3036646

NATIONAL HERBARIUM



PANAMA

COMPOSITAE

Neomirandea ternata R.M.K. & H.R.Prov. Chiriquí, Fortune Dam area,
Along Quebrada Ronito to E of road.
Alt. 1100 m; 8°45'N, 82°13'W.Terrestrial and epiphytic shrub;
flowers lavender.M.W. Churchill, 8 Feb. 1984
G. de Nevers & M. Stockwell 4734
MISSOURI BOTANICAL GARDEN HERBARIUM (MO)

Neomirandea ternata R. M. King and H. Robinson,
Holotype, United States National Herbarium.

Eupatorium L. Don



Curry State, National Herbarium

Mikania platylepis D. Don ex R. M. King & H. Robinson

det. R. M. King and H. Robinson

***Mikania platylepis* D. Don ex R. M. King and H. Robinson, Holotype, British Museum (Natural History).**

NEOTROPICAL MYRSINACEAE — XVII

Cyrus Longworth Lundell

Director, Plant Sciences Laboratory
The University of Texas at Dallas
Richardson, Texas 75083-0688

GENTLEA Lundell, *Wrightia* 3: 100. 1964

GENTLEA AURICULATA Lundell, sp. nov. — Frutex vel arbor parva, ad 6 m. alta; ramuli glabrati; folia glabra, subsessilis vel late petiolata, petiolo late marginato, ad 7 mm. longo; lamina coriacea, utrinque venosissima, obovato-elliptica vel oblanceolata, 6—14 cm. longa, 2.5—6.5 cm. lata, apice abrupte subacuminata, acumine acutiuscula, basi acuta vel subcuneata; inflorescentia terminalis, parva, late paniculata, ad 3.5 cm. longa, lepidoto-puberula; flores corymbosi, 5-meri; pedicelli fructiferi ad 1.2 cm. longi; sepala late ovata vel ovato-rotundata, ad 2 mm. longa, apice rotundata, ciliata, apice minute nigropunctata; corolla campanulata, ad 5.5 mm. longa, tubo ad 3 mm. alta, intus papillosa, extus minute et dense lepidota, lobis glabris, late ovatis, 2—2.5 mm. longis, basi auriculatis, apice acutiusculis, pallido-punctatis; stamina profunde inclusa; filamenta ca. 5.5 mm. longa; antherae parvae, ovato-cordatae, ca. 1 mm. longae; ovarium glabrum; stylus ca. 4 mm. longus; ovula 12, pluriseriata.

Guatemala: Dept. Zacapa, Sierra de Las Minas, middle and upper south-facing slopes of Volcan Gemelos, alt. 2100—3200 m., Jan. 26, 1942, Julian A. Steyermark 43277 (holotype, F; isotype, US; xerox and fragment, LL), shrub to small tree 4—20 ft. tall.

Gentlea auriculata is a remarkable new species distributed under the name Ardisia venosa Mast. [*Synardisia venosa* (Mast.) Lundell] probably because of the tubular-campanulate corolla. The distinctive corolla is unique in that the lobes are shorter than the campanulate tube, broadly ovate and with small rounded auricles at base, whence the specific epithet. The species is notable otherwise for its firmly coriaceous glabrous leaves which are venose on both surfaces and resembling Gentlea venosissima (R. & P.) Lundell in this aspect.

GENTLEA LANCIFOLIA Lundell, sp. nov. — Frutex 3 m.; ramuli graciles, minutissime rufo-lepidoti; folia parva, subtus minutissime lepidota, petiolata, petiolo marginato, ad 5 mm. longo; lamina chartacea, grisea, lanceolata vel oblanceolata, 2—4.5 cm. longa, 1—1.6 cm. lata, apice angustata, obtusiuscula, basi acutiuscula, revoluta, integra, punctata; inflorescentia terminalis, sessilis, parva, paniculata, ca. 1.5 cm.

longa, minute lepidota; pedicelli fructiferi ad 2.8 mm. longi, crassi; sepala parva, lanceolata, ca. 1 mm. longa; fructus globosus.

Honduras: Dept. Intibuca, cut over cloud forest between Calaveras and El Duraznillo, cordillera Opalaca, alt. 1800 m., March 12, 1970, Antonio Molina R. & Albertina R. Molina 25547 (holotype, F; xerox and fragment, LL), fruits black, shrub 3 m., common.

The species somewhat resembles Gentlea tenuis Lundell of southern Mexico. Gentlea lancifolia differs in leaf form and in its ashen appearance. There are only small infructescences on the type, and these are sessile with short thick apical pedicels. The indumentum is microscopic.

Like so many Myrsinaceae, the description is based on fruiting material from which the relationship can only be guessed.

GENTLEA MACULATA Lundell, sp. nov. — Arbor, 3—5 m. alta; ramuli crassiusculi, glabri vel parce lepidoti; folia glabrata, petiolata, petiolo late marginato, 0.5—1.2 cm. longo; lamina venosa, chartacea vel subcoriacea, lanceolata vel oblanceolata, 4—13.5 cm. longa, 2.5—5 cm. lata, apice acuminata, basi acuta, integra; inflorescentia terminalis, late paniculata, ad 5 cm. longa, lepidoto-puberula vel subglabra; flores racemoso-corymbosi, 5-meri; pedicelli graciles, ad 8 mm. longi; sepala maculato-punctata, ovata, acutiuscula, ad 2.2 mm. longa, hyalina; corolla ad 5 mm. longa, basi lepidoto-papillosa, extus basi minute lepidota; petala elliptico-lanceolata vel lanceolata, basi connata ca. 1 mm., supra glabra, apice acuta, parce punctata, stamina basi adnata; filamenta ad 7 mm. longa; antherae parvae, ovatae, ca. 0.7 mm. longae; ovarium globosum, glabrum; stylus ca. 5 mm. longus; ovula pluriseriata.

Honduras: Dept. Morazan, mixed dense and wet cloud forest on mountain La Tigra, southwest of San Juancito, alt. 1800—2100 m., Feb. 2, 1966, Antonio Molina R., Louis O. Williams, William C. Burger and Bruce Wallenta 16972 (holotype, F; isotype, US; xerox and fragment, LL), flowers white, tree 3—5 m.; common in dense forest.

Related to Gentlea micranthera (Donn. Sm.) Lundell, it differs in having venose leaves, some as well marked as those of Gentlea venosissima (R. & P.) Lundell, and in having larger flowers with the petals essentially glabrous on outer surface for apical two-thirds of their length. The surface of the smaller, narrower petals of Gentlea micranthera is densely lepidote-pulverulent to the very apex.

The species ranges into El Salvador and Nicaragua with one collection in Guatemala from Sierra de Las Minas (F). Most of the annotated collections are in F with some duplicates in US and NY.

The collections bear an old herbarium name, which is apparently unpublished.

MYRSINE L., Syst. ed. I (1735);
Gen. ed. I. 54 (1737)

MYRSINE CHIAPENSIS Lundell, sp. nov. — Frutex, ca. 5 m.; ramuli crassiusculi, glabri; folia glabra, petiolata, petiolo anguste marginato, ad 1.2 cm. longo, crassiusculo; lamina chartacea, discolor, obovato-elliptica, 7–12.5 cm. longa, 3–5.5 cm. lata, minute punctata, margine parce pellucido-punctata, integra, apice rotundata et minute emarginata, basi late attenuata, acuta; inflorescentia pauciflora; pedicelli crassiusculi, ad 2 mm. longi; flores pistillati, 5-meri; sepala parva, ovata, ca. 1 mm. longa, basi connata, carnosae, apice acutiuscula, parce nigropunctata; corolla ca. 3 mm. longa; petala lanceolata, nigropunctata, margine papillosa; stamina abortiva; stigma ad 1 mm. longa, lamellata; fructus subglobosus, ca. 4.5 mm. diam.

Mexico: Chiapas, Municipio of La Trinitaria, slopes with Montane Rain Forest, east of Laguna Tzikaw, Monte Bello National Park, elev. 1300 m., May 13, 1973, D. E. Breedlove 35246 (holotype, LL; isotype, Dudley 648133), shrub, 15 ft. tall.

The flowers are described from fragments in the infructescence.

MYRSINE COCLENSIS Lundell, sp. nov. — Arbor parva, ad 3.5 m. alta; ramuli minute puberuli vel glabrati, crassi; folia subcoriacea, glabra, longe anguste petiolata, petiolo ad 1.5 cm. longo; lamina glabra, perpunctata, anguste oblanceolata, 6.5–11 cm. longa, 2–3.4 cm. lata, apice lata, apiculata, basi attenuato-acuminata, revoluta, margine integra; inflorescentia masculina axillaris, pauciflora; pedicelli crassi, 2–2.75 mm. longi; flores minute puberuli, 5-meri, fasciculati; calyx ca. 1.5 mm. longus; sepala lanceolata, basi connata, apice subacuminata, ciliolata, nigropunctata; corolla ad 3.5 mm. longa; petala basi connata, lineari-lanceolata, ca. 3 mm. longa, minute puberula, apice acutiuscula, maculata; antherae crassae, oblongo-ellipticae, ad 1.5 mm. longae, apice apiculatae; ovarium glabrum; stigma parva, capitata.

Panama: Prov. Cocle, El Valle, Mesa, 6–6.5 km. from Main Street, ca. 1000 m., Jan. 16, 1977, J. P. Folsom 1352 (holotype, MO; isotype, LL), small tree of 3.5 meters; flowers pale green-white.

The species has distinctive comparatively large leaves, narrowly cuneate-acuminate at base, mostly obtusely rounded at apex and apiculate. The entire blade is conspicuously black punctate. Its axillary staminate flowers are few and fasciculate.

Myrsine coclensis appears to be related to Myrsine reflexiflora Lundell from the same locality.

MYRSINE COSTARICENSIS Lundell, sp. nov. — Arbor, 10 m. alta, glabra; ramuli crassiusculi; folia glabra, petiolata, petiolo ca. 7 mm. longo, raro 1.2 mm. longo, anguste marginato; lamina discolor, subcoriacea, elliptica, 6.5—10.5 cm. longa, usque ad 5.5 cm. lata, apice rotundata, minute emarginata, basi rotundata et acutiuscula, minute punctata, margine integra, parce pellucido-punctata, subtus reticulata; inflorescentia axillaris, cylindrica, bracteata, apice pauciflora; pedicelli ca. 1.5 mm. longi, crassiusculi; flores masculini 5-meri; sepala hyalina, lanceolata, ca. 1.5 mm. longa, acutiuscula, minute nigropunctata et lineata; petala lanceolata, ca. 3 mm. longa, dense nigropunctata, margine papillosa; antherae crassae, ovato-ellipticae, minute apiculatae, 1.5 mm. longae; stigma parva, capitata.

Costa Rica: Prov. San Jose, along gravel road 2 km. N of Highway 12, ca. 10 km. W of Interamerican Highway, pine forest, elev. 2200 m., Aug. 14, 1977, Thomas B. Croat 43380 (holotype, LL; isotype, MO), tree 10 m.; inflorescences old (flowers fragmentary).

Myrsine costaricensis and Myrsine chiapensis Lundell appear to be related, differing notably in leaf characteristics.

MYRSINE GILLYI Lundell, sp. nov. — Arbor, 5 m. alta, glabra; ramuli crassiusculi; folia subcoriacea, glabra, petiolata, petiolo 3—6 mm. longo, anguste marginato; lamina pallida, oblanceolata vel anguste obovato-oblonga, 3.5—7, raro ad 12 cm. longa, 1.8—4.2 cm. lata, apice late obtusa, basi angustata, subacuminata, revoluta, pellucido-punctata, parce lineato-punctata, integra; inflorescentia bracteata, pauciflora; pedicelli crassiusculi, 1—3 mm. longi; flores pistillati, 5- vel raro 6-meri, fasciculati; calyx ad 1.5 mm. longus; sepala basi connata, oblonga vel ovato-elliptica, inflexa, apice rotundata, raro acutiuscula, ciliolata, parce punctata; fructus globosus, ca. 4.5 mm. diam.; stigma ad 1 mm. longa.

Mexico: Nayarit, Mirador de Aguila, ca. 14 miles north of Tepic; fields and thickets above the barranca, and steep forested slopes within, elev. 450—600 m., Aug. 21, 1959, Charles Feddema 840 (holotype, LL), tree 5 m. high, ripe fruit blue-black. Nayarit, 14 to 17 miles west of Tepic along road over mountain to Jalcocotan; mixed, humid, tropical mountain forest bordering oak woodland, elev. 3000 to 4000 ft., June 24, 1951, H. S. Gentry & C. L. Gilly 10685 (paratype, LL, MEXU), small tree to about 4 m. tall, fruit black-purple. Nayarit, steep hillsides 2 miles west of Mazatan, region of red soils, savannah woodland, elev. 750 m., Sept. 17, 1960, Rogers McVaugh 19115 (paratype, LL), a small tree, occasional.

The tree of *Nayarit* has mostly small very pallid yellowish leaves which are conspicuously pellucid-punctate with small rounded glands. It has linear glands scattered over the lower surface of blades.

The leaves of *Myrsine Gillyi* have short marginate petioles, and leaf blades subcoriaceous and revolute at base. The yellow-green hue is rare among the Mesoamerican taxa. The pistillate flowers are not known, but fragments of the dried stigma persistent on fruits suggest that it is elongated and possibly laminate or lobed.

The species is named in honor of its first collector, C. L. Gilly, a student of the neotropical flora who made notable contributions to the taxonomy of the Sapotaceae.

MYRSINE JALISCENSIS Lundell, sp. nov. — Arbor, 5 m. alta, glabra; ramuli crassi vel crassiusculi; folia discolor, petiolata, petiolo ad 1.3 cm. longo, anguste marginato; lamina coriacea, oblanceolata, 7–12 cm. longa, 2–4 cm. lata, apice acuta, basi subcuneata, minute nigropunctata, margine glanduloso-punctata, integra; inflorescentiae e ramulis breviter sed manifeste cylindricis formatae, multi-florae; flores pistillati glabri, 5-meri, fasciculati, ad 3.5 mm. longi; pedicelli crassiusculi, 1.5–3 mm. longi; sepala ovata vel lanceolata, 1–1.5 mm. longa, acuminata, parce punctata, integra; corolla ad 3 mm. longa, basi tubulosa ca. 1.2 mm.; petala anguste lanceolata, basi stipitata, apice acuminata vel acuta, intus minute papillosa, nigropunctata; stamina abortiva; ovarium glabrum; stigma magna, ad 3 mm. longa.

Mexico: Jalisco, Sierra de Cuale, southwest of Talpa de Allende; southwest of the prominent peak called Piedra Rajada; barrancas in fir zone, on steep south- and west-facing slopes, elev. 2200 m., Nov. 19–21, 1952, Rogers McVaugh 14366 (holotype, LL; isotype presumably at MICH), tree, 5 m. high, flowers apparently white; one tree seen.

The remarkable large fleshy laminate and fimbriate-erose stigma distinguishes the species. Its acute leaves bordered with a marginal row of glands, thin sepals sparsely punctate and acute or acuminate, corolla tubular at base, with stipitate slender petals borne on the rim, and the narrow mostly acuminate petals with elongated black marginal glands are other features of note.

MYRSINE MICROCALYX Lundell, sp. nov. — Arbor, 4 m. alta; ramuli tomentelli; folia parva, petiolata, petiolo tomentello, ad 1 cm. longo; lamina chartacea, glabrata, anguste oblanceolata, 3–6.5 cm. longa, 7–15 mm. lata, apice acutiuscula, basi acuminata et subtus tomentella, discolor, punctata, utrinque reticulata; inflorescentia masculina, multiflora; flores glomerati, 5-meri, subsessiles; pedicelli crassi, puberuli; sepala parvissima, ovata, 0.4–0.6 mm. longa, acuta, ciliolata,

parce nigropunctata, minute puberula, basi connata; corolla 2.5—3 mm. longa; petala lanceolata, nigro-lineato-punctata, basi connata, apice acuta, minute puberula; antherae ovato-oblongae, crassae, 1.2—1.5 mm. longae; ovarium glabrum, ovoideum; ovula 1; stylus ca. 0.3 mm. longus, lobatus, erectus.

Panama: Prov. Chiriqui, Cerro Colorado, 24 miles on gravel road from bridge over Rio San Felix; disturbed primary vegetation, 1430 m., Nov. 22, 1979, T. Antonio 2619 (holotype, LL), tree to 4 m. tall on steep slope, petals greenish.

A montane species which is notable for its fine pubescence of branchlets, petioles, base of leaves on lower surface, and minutely puberulent densely glomerate subsessile flowers on short spurs. The small oblanceolate leaves with long very slender petioles borne on slender branchlets further distinguish the taxon. The sepals are minute and ovate-triangular, acute and ciliate.

The single large ovule in the placenta indicates that the species is perhaps hermaphroditic.

MYRSINE SYTSMAE Lundell, sp. nov. — Arbor, 8 m. alta; ramuli crassiusculi, apice minute puberuli, glabrati; folia novella minute puberula, glabrata, petiolata, petiolo 2—5 mm. longo, crasso, marginato; lamina subcoriacea, anguste oblanceolato-oblonga, 5—9 cm. longa, 1.5—2.5 cm. lata, apice obtusa, basi acutiuscula, revoluta, subtus reticulata, punctata, margine integra, pellucido-punctata; inflorescentia axillaris, bracteata, apice pauciflora; flores staminati 5-meri; pedicelli crassi, ad 1 mm. longi; sepala anguste lanceolata, ca. 1 mm. longa, acutiuscula, paucipuberula; corolla minute papilloso-puberula, ca. 3 mm. longa; petala basi connata ad 1 mm., lanceolata, apice obtusiuscula, parce nigropunctata vel epunctata; antherae crassae, late ovato-ellipticae, ad 1.4 mm. longae, apiculatae; ovarium glabrum; stigma abortiva, conica.

Panama: Prov. Los Santos, road to El Cortezo, alt. 100—200 m., Jan. 24, 1981, W. G. D'Arcy & K. Sytsma 14355 (holotype, LL), tree 8 m. tall, flowers white.

A taxon of low altitudes, Myrsine Sytsmae has very slender oblanceolate-oblongish leaves with short petioles, the margin revolute at acutish base. Leaf blades are narrowed to the obtuse apex. It has subsessile staminate flowers with small narrow sepals and conspicuously but minutely papillose-puberulent petals. Some of the petals have one to several small black glands.

Myrsine Sytsmae resembles Myrsine panamensis (Lundell) Lundell in some features, and both are low altitude taxa.

NOTES ON THE GENUS CLERODENDRUM (VERBENACEAE). VIII

Harold N. Moldenke

This paper is a continuation of the notes on this genus begun by me in *Phytologia* 57: 157 (1985) and most recently continued in 58: 178--218 (1985).

CLERODENDRUM Burm.

Additional & emended bibliography: *Almaga* in *Pirotta*, *Fl. Col. Erit.* [Ann. Inst. Bot. Roma 8:] 134. 1903; *Elm.*, *Leafl.* *Philip. Bot.* 5: 1847--1849. 1913; *Dinter*, *Feddes Repert. Spec. Nov.* 16: 168. 1919; *DeWild.*, *Contrib. Fl. Katanga* 165--167. 1921; *Corner*, *Wayside Trees*, ed. 2, 695, 696, & 699--701. 1952; *Wycherley & Nair*, *Proc. Sympos. Humid Trop. Veg.* 274 & 277. 1958; *Mold.*, *Dansk Bot. Arkiv* 23: 87--88. 1963; *Corner*, *Life Pl.*, imp. 1, 275 & 294. 1964; *Corner & Watanabe*, *Illust. Guide Trop. Pl.* 753--757. 1969; *Corner*, *Life Pl.*, imp. 2, 275 & 294. 1981; *Mold.*, *Phytologia* 58: 178--218. 1985.

CLERODENDRUM BROOKEANUM W. W. Sm.

Additional bibliography: *Mold.*, *Phytologia* 58: 218. 1985.

Smith (1915) comments: "As pointed out by Sir Joseph Hooker in *Bot. Mag.* under tab. 7887, the Bornean plant is closely allied to *C. myrmecophila*. *Ridley*. The manuscript name *C. macrophyllum*, *Hook.*, is antedated by *C. macrophyllum*, *Sims*, a synonym of *C. serratum*, *Spreng.*" The *C. macrophyllum* *Hort.* is also a synonym of *C. serratum* (L.) *Moon*, while *C. macrophyllum* *Blume* is *C. phyllomega* *Steud.*

Nothing is known to me of *C. brookeanum* except what is stated in the literature.

CLERODENDRUM BROOKSII Ridl., *Kew Bull. Misc. Inf.* 1925: 88 [as "*Clerodendron*"]. 1925; *Mold.*, *Known Geogr. Distrib. Verbenac.*, ed. 1, 63 & 89. 1942,

Synonymy: *Clerodendron brooksii* *Ridl.*, *Kew Bull. Misc. Inf.* 1925: 88. 1925.

Bibliography: *Ridl.*, *Kew Bull. Misc. Inf.* 1925: 88. 1925; *A. W. Hill*, *Ind. Kew. Suppl.* 7: 51. 1929; *Fedde & Schust.*, *Justs Bot. Jahresber.* 53 (1): 1072. 1932; *Mold.*, *Known Geogr. Distrib. Verbenac.*, ed. 1, 63 & 89 (1942) and ed. 2, 143 & 180. 1949; *Mold.*, *Résumé* 187 & 448. 1959; *Mold.*, *Fifth Summ.* 1: 321 (1971) and 2: 862. 1971; *Mold.*, *Phytol. Mem.* 2: 312 & 534. 1980.

A subshrub, almost entirely glabrous; leaves decussate-opposite; petioles 2 cm. long; leaf-blades herbaceous, oblong-ob lanceolate, 22 cm. long, 8.4 cm. wide, apically acuminate, marginally sinuate, basally narrowed and obtuse or subrotundate; midrib prominent beneath; secondaries 7 or 8 pairs; inflorescence terminal, paniculate, loose, erect, 13 cm. long; peduncles 4 cm. long; bracts linear, 1 cm. long, apically acute; bractlets similar but smaller; pedicels very slender, 7 mm. long; sepals lanceolate, 5 mm. long, apically acute or acuminate, basally connate, puberulent; corolla white, puberulent,

its tube slender, 1 cm. long, the lobes oblong, apically rotundate, dorsally puberulent; stamens long-exserted; filaments filiform; anthers oblong-linear, basally bifid.

The species is based on *Brooks 9240* from Lubok Tandai, Sumatra. It is said by Ridley (1925) to be allied to *C. disparifolium* Blume, "but the plant is almost entirely glabrous, the sepals broader and shorter, the corolla not hairy but minutely puberulous." Nothing is known to me of this species except what is stated in the bibliography.

CLERODENDRUM BRUNFELSII FLORUM H. Hallier, Meded. Rijks Herb. Leid. 37: 68. 1918.

Synonymy: *Clerodendrum catalpifolium* H. Hallier, Meded. Rijks Herb. Leid. 37:67. 1918. *Clerodendron brunfelsiiflorum* Hall. f. apud H. J. Lam, Verb. Malay. Arch. 275 & 363. 1919. *Clerodendron catalpifolium* Hall. f. apud H. J. Lam, Verb. Malay. Arch. 375 & 363 in syn. 1919.

Bibliography: H. Hallier, Meded. Rijks Herb. Leid. 37: 67--68. 1918; H. J. Lam, Verb. Malay. Arch. 275 & 363. 1919; Bakh. in Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 91, 108, & viii. 1921; A. W. Hill, Ind. Kew. Suppl. 6: 49. 1926; Mold., Alph. List Inv. Names 16. 1942; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 66 & 89 (1942) and ed. 2, 148 & 180. 1949; Mold., Résumé 198, 261, & 448. 1959; Mold., Fifth Summ. 1: 331 & 442 (1971) and 2: 862. 1971; Mold., Phytol. Mem. 2: 322 & 534. 1980.

A subshrub; branchlets terete or obtusely tetragonal, 3--6 mm. in diameter, compressed at the nodes, very softly ochraceous- or ferruginous-villous or -hirsute, the hairs dense, short, and rather spreading; leaves decussate-opposite, anisophyllous; petioles 2--16 cm. long, subterete, dorsally narrowly or obsoletely sulcate, densely soft-villous or -hirsute like the branchlets; leaf-blades ovate or ovate-lanceolate, 9--30 cm. long, 4.5--16 cm. wide, apically caudate (the acumen long and narrow), marginally entire, basally acute to subrotund or cordate, greenish-brown above in drying and sparsely setulose when young, subglabrous (except for the venation) above when adult, paler beneath, prominently subpalmately pinnate- and clathrate-veined, densely villous on the larger venation beneath like the branchlets, minutely glandular-punctulate on both surfaces, more conspicuously so beneath and especially so basally and near the midrib and secondaries, the glands discoid; tertiaries laxly transverse; veinlet reticulation fine; inflorescence terminal, paniculate, pyramidal, trichotomous, densely soft-villous or -hirsute like the branchlets, the pubescence mixed with glandular-capitate hairs; lower bracts similar to the leaves, the upper ones gradually smaller and lanceolate, the ultimate ones linear, pedicels 4--5 mm. long, about as long as or shorter than the calyx; calyx cyathiform, 5--10 mm. long, 5-fid to 1/4 to 1/2 its length, externally densely soft-hirsute, red (?) when fresh, the lobes about 3 mm. long, apically acute, more loosely hirsute and obsoletely glandulose; corolla cyathiform, externally slightly glandulose and sparsely hirtellous with weak, multi-septate, spreading hairs, the tube slender, 1.6--2 cm. long, 2--4 times as long as the calyx, plainly incurved in bud, finally straight,

the lobes oblong-obovate, 3--7 mm. long, 1/5 to 1/4 as long as the tube; stamens long-exserted, the free portion 1--3 cm. long.

The type of this species is an unnumbered collection of DeVriese & Teijsmann from Buruh [Buru] in the Molucca Islands, collected in 1859 or 1860. The type of *C. catalpifolium* is also an unnumbered collection by the same collectors from the same island and made during the same years. Hallier (1918) notes for the latter: "Sp. 5 praecedentibus et *Cl. buruano* Miq. arcte affinis, a posteriore inter alias notas corollae tubo longiore genitalibusque alte exsertis bene distinctum." For *C. brunfelsiiflorum* he says "Sp. praecedente [*C. catalpifolium*], *Cl. lindavianum* Lauterb. et *Cl. buruano* arcte affine, a posteriore inter alias foliis nunquam subcordatis, calyce multo longiore, genitalibus alte exsertis bene distinctum." It seems most likely to me that all are merely varieties or forms of *C. buruanum* Miq.

It may be worth noting here that Hill, in the Index Kewensis (1926), incorrectly cites the original publication of *C. brunfelsiiflorum* to page "78" instead of 68.

CLERODENDRUM BRUNNESCENS Mold., Amer. Journ. Bot. 38: 321. 1951.

Synonymy: *Clerodendrum brunescens* Mold. in Humbert, Fl. Madag. 174: 193, fig. 31 (6 & 7) sphalm. 1956.

Bibliography: Mold., Amer. Journ. Bot. 38: 321. 1957; Mold. in Humbert, Fl. Madag. 174: 151, 193, 195, 196, & 267, fig. 31 (6 & 7). 1956; Mold., Résumé 155 & 448. 1959; G. Taylor, Ind. Kew. Suppl. 12: 26. 1959; Mold., Fifth Summa 1: 259 (19/1) and 2: 862. 1971; Mold., Phytol. Mem. 2: 248 & 534. 1980; Mold., Phytologia 58: 187. 1985.

Illustrations: Mold. in Humbert, Fl. Madag. 174: 193, fig. 31 (6 & 7). 1956.

An epiphytic shrub, about 4 dm. tall, simple or sparingly branched; stems and branches medium-stoutish, compressed-tetragonal, prominently lenticellate, glabrous; nodes not annulate; principal internodes very much abbreviated, 0.5--2.3 cm. long; leaf-scars very large and prominent; leaves decussate-opposite; petioles stout, nigrescent, 1--2 cm. long, glabrous; leaf-blades membranous, brunnescent in drying, elliptic, 9--19 cm. long, 5--9 cm. wide, apically acute or very slightly short-cuspidate to acuminate, marginally entire, basally acute or acuminate, glabrous or subglabrate on both surfaces, more or less black-glandulose on the lamina along the midrib beneath; midrib slender or stoutish, flat above, very prominent beneath; secondaries very slender, 6--9 per side, arcuate-ascending, flat above, prominent beneath, arcuately joined near the margins beneath; vein and veinlet reticulation sparse, indiscernible above, only the larger parts prominulous beneath; inflorescence terminal, cymose, few-flowered; peduncles obsolete; cyme-branches flattened, nigrescent, peduncle-like, 2.5--3.5 cm. long, glabrous; pedicels slender, flattened, nigrescent, 3--4 mm. long, glabrous; foliaceous bracts absent; bractlets and prophylla linear-setaceous, 2--7 mm. long, nigrescent, glabrous; calyx subcoriaceous, obconic, nigrescent, 3--4 cm. long, 1--1.3 cm. wide, glabrous, not at all venose, its rim deeply 5-lobed, the lobes ovate, erect, firm, about 8 mm. long, apically attenuate-acute.

The type of this unique, apparently endemic species, of which neither corolla nor fruit is known to me, was collected by Henri Perrier de la Bâthie (no. 10240) in a forest in the vicinity of Analamazoatra, in east-central Madagascar, in January (apparently in bloom), 1932, deposited in the Paris herbarium. Because of the lack of corolla and the essential organs, the systematic position of this taxon must remain problematic, although the Paris botanists, well acquainted with the Madagascar flora, are of the opinion that it is a species of this genus. It is known thus far only from the original collection.

Citations: MADAGASCAR: *Perrier 10240* (E--photo of type, F--photo of type, Ld--photo of type, N--fragment of type, N--photo of type, P--type).

CLERODENDRUM BRUNSVIGIOIDES J. G. Baker, Journ. Linn. Soc. Lond. Bot. 21: 435 [as "*Clerodendron*"]. 1885; Mold., Revist. Sudam. Bot. 8: 170. 1950.

Synonymy: *Clerodendron? brunsvigioides* J. G. Baker, Journ. Linn. Soc. Lond. Bot. 21: 435. 1885.

Bibliography: J. G. Baker, Journ. Linn. Soc. Lond. Bot. 21: 435. 1885; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1: 560. 1893; Mold., Revist. Sudam. Bot. 8: 170. 1950; Mold. in Humbert, Fl. Madag. 174: 153, 217, 221--222, & 266, fig. 35 (5). 1956; Mold., Résumé 155 & 448. 1959; Mold., Fifth Summ. 1: 259 (1971) and 2: 862. 1971; Mold., Phytol. Mem. 2: 248 & 534. 1980; Mold., Phytologia 58: 188. 1985.

Illustrations: Mold. in Humbert, Fl. Madag. 174: 217, fig. 35 (5). 1956.

An erect shrub; branches and branchlets very slender, more or less obtusely tetragonal, light-gray, glabrescent, not noticeably lenticellate; twigs very slender, brownish, obscurely pilose or strigose with brownish antrorse hairs, glabrescent in age; nodes not annulate; principal internodes mostly very much abbreviated, 0.6--2.5 cm. long; leaves decussate-opposite; petioles slender, 4--8 mm. long, mostly extremely abbreviated, densely short-strigose like the twigs, canaliculate above, often submargined; leaf-blades thin-membranous, fragile in drying, rather uniformly green on both surfaces or slightly lighter beneath, dark-brunnescent in drying, narrowly elliptic [not oblong and moderately firm as stated by Baker], 4.5--11.5 cm. long, 1.7--3.6 cm. wide, apically acute or slightly acuminate, marginally entire, basally gradually attenuate or long-acuminate, glabrous and shiny above, very sparsely and obscurely strigillose on the larger venation beneath, otherwise subglabrate; midrib very slender, flat above, prominulous and short-strigose beneath; secondaries very slender, 6 or 7 per side, flat above, very slightly subprominulous beneath, arcuate-ascending, sometimes conspicuously arcuate-joined near the margins beneath; vein and veinlet reticulation mostly very obscure or indiscernible on both surfaces; flowers mostly solitary, rarely 2 per peduncle, axillary, mostly shorter than the mature subtending leaf, borne at the tips of the twigs; peduncles subfiliform, to 7.5 cm. long, sparsely and obscurely strigillose with short antrorse hairs, glabrescent in age, ascen-

ding-divergent; pedicels mostly 1--3 mm. long, comparatively stoutish, strigillose; bracts, bractlets, and prophylla absent or caducous; calyx obconic-infundibular, thin-membranous, 1.5--2 cm. long, apically to 1 cm. wide, externally antrorsely strigillose, its rim deeply 4-lobed, the lobes erect, ovate, about 5 mm. long and (basally) wide, apically acute; corolla hypocrateriform, its tube infundibular, about 3 cm. long, externally glabrous, basally (within the calyx) cylindric, gradually ampliate from above the top of the calyx to its apex, the limb to 3 cm. in diameter, 5-lobed, the lobes subequal, orbicular, imbricate, about 1.3 cm. long and wide, apically rounded; stamens and style included in the corolla-tube, not exerted.

This endemic species is based on *Baron 2716* from between Antsihanaka and the east coast, Madagascar, deposited in the Kew herbarium. Baker (1885) notes that the species is "*Near C.? petunioides*". It is said to inhabit forests at middle altitudes, flowering in July and August. To distinguish it (and the preceding species) from other Madagascar taxa, see under *C. baronianum* Oliv. in the present series of notes.

Citations: MADAGASCAR: *Baron 2716* (F--photo of type, K--type, Ld--photo of type, N--fragment of isotype, N--photo of type, P--isotype); *Herb. Mus. Paris s.n.* (P).

CLERODENDRUM BUCHANANI (Roxb.) Walp., *Repert. Bot. Syst.* 4: 108 [as "*Clerodendron*"]. 1845; Steud., *Nom. Bot. Phan.*, ed. 2, 1: 382. 1840.

Synonymy: *Volkameria buchananii* Roxb., *Hort. Beng.*, imp. 1, 46 hyponym. 1814. *Clerodendrum buchananii* Roxb. ex Wall., *Numer. List* 82, no. 2653. 1831. *Volkameria buchananii* Roxb., *Fl. Indica*, ed. 2, imp. 1, 3: 60. 1832. *Clerodendron buchananii* (Roxb.) Walp., *Repert. Bot. Syst.* 4: 108. 1845. *Clerodendron buchananii* Wall. ex Voigt, *Hort. Suburb. Calcut.* 466. 1845. *Clerodendron blumeianum* Schau. in A. DC., *Prodr.* 11: 669. 1847 [not Hall. f., 1923, nor Val., 1921]. *Clerodendron buchananii* Walp. apud Hassk., *Retzia* 60. 1855 [not *C. buchaninii* Walp. apud H. J. Lam, 1919]. *Clerodendron infortunatum* Blume ex Fern.-Villar in Blanco, *Fl. Filip.*, ed. 3, 4: Nov. App. 161 in syn. 1880 [not Auct., 1963, nor Blume ex H. Hallier, 1918, nor Bot. Reg., 1895, nor Dennst., 1893, nor Gaertn., 1885, nor Lam, 1947, nor L., 1753, nor Lour., 1793, nor Schau., 1847, nor F.-Vill., 1882, nor Walp., 1843, nor R. Wight, 1850]. *Clerodendron buchananii* Roxb. apud C. B. Clarke in Hook. f., *Fl. Brit. India* 4: 596. 1885. *Clerodendron buchananii* Herb. Roxb. apud Jacks. in Hook. f. & Jacks., *Ind. Kew.*, imp. 1, 1: 560. 1893. *Clerodendron blumeianum* Schau. apud Boorsma, *Meded. Lands Plant.* 31: 7 sphaerm. 1899. *Clerodendron buchananii* Walp. apud Bakh. in Lam & Bakh., *Bull. Jard. Bot. Buitenz.*, ser. 3, 3: viii in syn. 1921. *Clerodendron buchananii* var. *typica* Bakh. in Lam & Bakh., *Bull. Jard. Bot. Buitenz.*, ser. 3, 3: 91--92. 1921. *Clerodendron foetidum* Miq. ex Bakh. in Lam & Bakh., *Bull. Jard. Bot. Buitenz.*, ser. 3, 3: 91 in syn. 1921 [not Bunge, 1833, nor D. Don, 1825, nor *Clerodendrum foetidum* Hort., 1853]. *Clerodendron infortunatum* Murray ex Bakh. in Lam & Bakh., *Bull. Jard. Bot. Buitenz.*, ser. 3, 3: 91 in syn. 1921. *Clerodendron blumeianum* Schau. a-

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A tall, erect, ornamental, very showy shrub or subshrub, 1--3 m. tall, sometimes herbaceous or bushy; stems erect, rather stout, rather acutely tetragonal, minutely and obscurely pulverulent-puberulent, often flattened at the nodes and decussately sulcate on the internodes, myrmecophilous; branches few, opposite, divaricate; nodes annulate, often marked by a light band of longer hairs; principal internodes abbreviated, about 2.5 cm. long; leaves decussate-opposite, large, numerous; petioles stout, terete, 13--16 cm. long, usually collapsing at the base and apex when drying, densely but minutely and obscurely pulverulent-puberulent throughout; leaf-blades membranous, very brittle and fragile when dry, ovate or broadly ovate

to cordate-ovate, bright-green above, paler beneath, 14--30 cm. long, 9--20 cm. wide, mostly $1\frac{1}{2}$ -- $1\frac{3}{5}$ times as long as wide, apically regularly attenuate-acute or acuminate, marginally entire or sinuate and minutely apiculate-toothed, basally deeply cordate, very minutely puberulent-roughened and also more or less scattered-pilose above, more densely so beneath, not scaly; midrib flat and densely puberulent above, stout, red, and rounded-prominent beneath; secondaries slender, 6--8 per side, arcuate-ascending, flat and densely puberulent above, usually 2 or 4 issuing from the very base of the blade, reddish beneath; tertiaries rather distant; veinlet reticulation indiscernible above; inflorescence terminal, paniculate, 5--20 cm. long, erect; peduncles acutely tetragonal, continuous with and similar to the adjacent stem, 2--10 cm. long, red, villous; rachis similar to the peduncle; sympodia abbreviated; inflorescence-branches slender, flattened, ascending; bracts borne in pairs subtending the lowermost inflorescence-branches, foliaceous, the uppermost ones linear and only 2--6 mm. long, red, puberulent or villous; individual cymes 7--15-flowered; young buds 3--5 mm. in diameter; pedicels villous, red; calyx fleshy, carmine or orange, 3--5 mm. long, the 5 segments narrow-lanceolate, appressed, basally at most 1.5 mm. wide; corolla bright-red or fire-red to scarlet or carmine, rarely light-yellow, the tube 1.2--3 cm. long, 5--6 times as long as the calyx, the lobes 7--15 mm. long, 4--5 mm. wide; exerted portion of the stamens 2--2.5 cm. long, about twice as long as the corolla-lobes; filaments pink; anthers sordid-red; style pink or red, 3--4 cm. long; stigma dark-red or yellow; fruiting-calyx often eventually enlarged, enclosing only the lower part of the fruit, fleshy, red or bright-red to scarlet or orange; fruit drupaceous, at first green or dark-green, later orange or bright-blue, torquoise or blue-violet to black, 8--9 mm. wide, apically 4-lobed; seed bitter, not poisonous, containing no alkaloids.

This species is based on an unnumbered Zuchanan collection in the East India Company herbarium at Kew; *C. blumeum* is based on Blume s.n. and Zollinger 747 from Java. The *Clerodendron infortunatum* accredited to Auct. in the synonymy (above), to Bot. Reg., to Dennstedt, to Gaertner, and to Linneus (ex parte Rumpf) are all synonyms of *Clerodendrum infortunatum* L., while that accredited to Blume (1918), to Loureiro (in part), and to Schauer are *C. viscosum* Vent.; the homonyms accredited to Walpers and to Wight (1850) are *C. villosum* Blume; that credited to Loureiro (in part) is *C. kaempferi* (Jacq.) Sieb.; that credited to Lamarck is *C. petasites* (Lour.) S. Moore; and that credited to Fernandez-Villar is *C. minahassae* Teijsm. & Binn. The *Clerodendrum infortunatum* credited to Gaertner and to Ventenat are *C. infortunatum* L., while the homonym credited to Auct., to "Auct. non Linn.", to Miquel, and to Willdenow are *C. viscosum* Vent. the homonym credited to Linneus (ex parte Rheede), to Wight, and to Dennstedt are *C. villosum* Blume, while the homonym credited to Lindley is *C. speciosissimum* Van Geert.

The *Clerodendron foetidum* of Don is *Caryopteris foetida* (D. Don) Thellung, that of Bunge is *Clerodendron bungei* Steud., and the *Clerodendrum foetidum* Hort. is *C. lindleyi* Decaisne. The *Clerodendron blumeum* and *Clerodendrum blumeum* of Valetton are *C. specio-*

sisissimum Van Geert. and the *Clerodendron blumeum* credited to Hallier is a synonym of *Clerodendrum intermedium* Cham. It should also be noted here that the *C. buechanani* var. *fallax* (Lindl.) Bakh. is now by me regarded as a synonym of *C. speciosissimum*, as is also *C. blumeum* var. *typicum* H. J. Lam; *C. blumeum* var. *horsfieldii* (Miq.) Kuntze is treated by me as *Clerodendrum horsfieldii* Miq., which see.

Jackson (1895) reduces *Volkameria buechanani* Roxb. to *Clerodendrum foetidum*, by which he probably meant *C. foetidum* Bunge, now known as *C. bungei* Steud., but these two taxa are quite distinct.

The species with which *C. buechanani* is most easily confused and which most closely resembles it is *C. speciosissimum* Van Geert. Numerous collection have in the past been identified as *C. buechanani* by many authors, including myself, which actually represent *C. speciosissimum* instead. The two taxa are best distinguished as follows:

1. Calyx 3--5 mm. long, with narrow-lanceolate and appressed lobes; corolla-tube 5--6 times as long as the calyx, the corolla-lobes 7--10 mm. long, 4--5 mm. wide; young buds 3--5 mm. in diameter; stamens twice as long as the corolla-lobes, 2--2.5 cm. long; style 3--4 cm. long.....*C. buechanani*.

1a. Calyx 7--12 mm. long, with ovate or deltoid spreading lobes; corolla-tube 3--4 times as long as the calyx, the lobes 1--2.5 cm. long and to 10 mm. wide; young buds 7--12 mm. in diameter; stamens 3 times as long as the corolla-lobes, 4--6 cm. long; style 6--7 cm. long.....*C. speciosissimum*.

Lam (1919) reduces *Clerodendron buechanani* Walp. to *Caryopteris grata* [now known as *C. foetida* (D. Don) Thellung]. Walpers (1845) includes under *Clerodendron buechanani* the following: *Volkameria coccinea* Herb., *V. kaempferi* Jacq., and *Clerodendron coccineum* Hort., all names now included by me in the synonymy of *Clerodendrum kaempferi* (Jacq.) Sieb.

Merrill (1921) adopts *C. blumeum* Schau. as the accepted name for what I regard as *C. buechanani* (Roxb.) Walp.

Collectors have encountered *C. buechanani* in open and disturbed lowland forests, secondary forests and young secondgrowth rainforests, frequent on beaches and in beach forests, in brushwood and village groves, the inside of craters, the edges of high rainforests, marshy ground near streams, and in shaded places and secondgrowth in general, from sealevel to 2000 m. altitude, in flower in every month of the year, and in fruit in January, April, July, August, September, and December.

The corollas are described as having been "red" on Boden-Kloss 11640, Brass 24446, Buwalda 4991, Posthumus 556, and Yates 848, "orange-red" on Oldeman & Maurice M.22 and Seibert 1771, "orange", on Essig LAE.55013, "scarlet" on Hochreutiner 1110, and "light-yellow" on DeBruyn 282.

Especially typical ovate leaf-blades are seen on Backer 1850 & 25464, Bakhuizen 465 & 639, Boden-Kloss 14640, Blinnemeijer 6018, Hallier B.21 & B.114, Jacobson 2660, Kobus s.n., Mjßberg 173, Mondi 39, Posthumus 556 & 713, Soegandiredja 85, 129, & 206, Van Steenis 802 & 3939, and Yates 848 and distinctly cordate on Atje 309.

Vernacular names reported for *C. buechanani* are "andiliára",

"aepaloelan mahina", "arka-koo", "aupaloelan mahina", "aux zalba", "balantaná", "bantana", "kallon ranteh", "keh neno", "kembang boegang", "kěmbang boegang", "kembang boogang", "koikoi", "kolon ranteh", "malati", "maroerang", "mata ajam", "oema abmōta", "orawari rungkup", "panggil-panggil", "pansarāng'a", "patjah piring", "singoe", "tadjoer", "tilangit", "tinting", "titinga", "waroe dojong", and "waroe dujong".

Hallier (1918) asserts that the species is used in the treatment of fevers; Wehmer (1931) avers that the bitter seeds contain no poisonous alkaloid. Burkill (1966) reports that in Java magic properties are attributed to the plant and that in Amboina newly born babies are ceremoniously washed in a leaf decoction made from the plant. Uphof (1968) tells us that the crushed leaves are used in native medicines to treat dysentery, the roots to counteract snakebites, especially of certain vipers, and a paste made from the leaves is applied to wounds caused by burns. Hartwell (1971) reports that in Indonesia the leaves are used as a poultice in treating tumors. Lewis & Elvin-Lewis (1977) also report the use of a leaf paste in treating burns in Malaya and the roots for snakebites.

Heyne (1917), calling the plant *C. blumeanum*, speaks of it as follows: "Opgerichte heester, 1 tot 2 M. hoog, in West-Java groeiend tusschen 70 en 800 M. zeehoogte in bosschen en schaduwrijke struikwildernissen (Backer, Tropische Natuur 1916, bl. 93) Rumphius beschrijft hem (IV. bl. 108) onder den naam van *Petasites agrestis* en zegt, dat hij velerlei nut heeft in de medicijnen. Op Banda gebruikt men den wortel tegen oepas, die gepaard gaat met steken in de zijde en braken. Tegen dysenterie mengt men hem fijngewreven onder het eten, of kookt hem met de jonge loten even op in verse sagoëer, die men daarna drinkt. In de Oelassers komt een soort van adder voor, waarvan de beet doodelijk is, tenzij men dadelijk den wortel van deze plant kauwt, het sap daarvan ten deele inslikt en met het overige het mondje verbindt: daarop moet braken volgen, wil het middel helpen. Thuis komende moet men de bladeren warm maken, 't sap innemen en ook op de wond smeren. Deze bladders, met klapperolie bestreken warm gemaakt en op den buik gelegd, verzachten een verhard buik en winderig koliek. Een papje ervan geneest brandwonden en brengt gezwollen en bloedvinnen tot rijpheid. Men geeft ze ook in tegen koorte en om de ambonsche pokken (framboesia) uit te krijen en gebruikt ze naderhand uitwendig om die te doen opdrogen. Mer curcuma gesmeerd, warm gemaakt en opgelegd, doen ze een gezwollen milt slinken. Zoowel de bladeren van deze soort als die van *Clerodendron Rumphianum*, De Vr. worden door de ambonsche vroedvrouwen veel gebruikt om in het warme water te doen, waarmede pasgeboren kinderen worden gewasschen, voorgevende, dat dit niet alleen dient om de kinderen te reinigen, maar ook om ze voorspoedig te doen opgroeien (Rumph.)." It seems probable that at least the Rumpf references here apply to *C. speciosissimum* rather than to *C. buchanani*.

Kuntze (1891) records *C. buchanani*, perhaps from cultivation only in Java; Fernandez-Villar (1880) lists it from Panay island in the Philippines. Hallier (1918) found it growing with *Stephania* and *Cucurbitaceae* near Manila; Rumpf reports it wild on "all" of the Amboina and Banda islands. Merrill (1923) excludes it from the native Philippine flora. Canfield describes it as an uncommon shrub in open

forests on volcanic humus, growing in association with *Artocarpus*, *Citrus*, *Morinda*, *Guettarda*, *Areca*, *Cocos*, *Musaenda*, and *Alpinia*. Duss reports it both cultivated and wild (escaped) in Antigua, Martinique, and Guadeloupe; Hahn lists it as "perhaps" introduced in Martinique; Seibert found it wild in Haiti. It is, however, very probable that some, if not all, these references apply to *C. speciosissimum*, rather than to *C. buchanani*. The "*C. buchanani*" of Woodrow (1910) is certainly a misidentification for *C. speciosissimum*. The illustration given by Graf (1963), labeled as depicting *C. buchanani*, actually depicts *C. paniculatum* L. Fosberg and his associates (1979) assert that *C. buchanani* is not known "in its typical form" in Micronesia -- they regard *C. blumeanum* as a synonym of what we call *C. speciosissimum*. Burkill (1966) includes *C. fallax* Lindl. in the synonymy of *C. buchanani*, but I regard it as a synonym of *C. speciosissimum*.

Voigt (1845) reports *C. buchanani* cultivated in Calcutta. Valetton (1907) cites *Clerodendron infortunatum* Blume, *C. papuanum* Scheff., and *C. fallax* "Lindl. non Schau." as synonyms of *C. blumeanum* -- I regard at least the last two of these as synonyms of *Clerodendrum speciosissimum*.

Hallier (1918) includes *C. fallax* Lindl., *C. pulchrum* Fawc., and *Petasites agrestis* Rumpf in his concept of *C. buchanani*, so probably his citations are in part, at least, referring to *C. speciosissimum*. He cites: from Sumatra Beccari 820, Hallier B.21 & B.114 and Korthals s.n.; from Borneo Korthals s.n.; from Java Blume s.n., Hallier 276 and Raap 526; from Lombok Elbert 591, 676, 901, 968, 1006, 1684, 1740, 1812, 1836, 1882, & 2095; from Sumbawa Colfs 130, Elbert 3538, 3982, & 4428, and Grundler 4053, 4163, 4202, & s.n. [Elbert 4029]; from Buton Zippelius 32a; from Tukang-besi Elbert 2545; from Wetar Elbert 4491, 4510, 4567, & 4622; from Banda Herb. Lugd.-Bat. s.n.; from Amboina Forsten s.n.; from northwestern New Guinea Atasrip 57; from Luzon Hallier 3519; and from Timor Forbes 3604.

Lam (1919) cites the following, but probably all of these actually apply to *C. speciosissimum*: Dahl 117, Docters van Leeuwen-Reijnvaan 1375 & 1630, Elbert 591, 676, 2095, & 3982, Gibbon 1201, Gjellerup 422 & 695; Lauterbach 1193, Ledermann 6938, 10808, & 14133, Peekel 197, Raymundus 41, Schlechter 14273 & 16402, Volken 130, 157, & 500, and Weinland 60.

Bakhuizen (1921) includes *C. papuanum* Scheff., *C. puberulum* Merr., *C. fallax* Lindl., *C. foetidum* Miq., *Caprifolium scarlatinum* Noronha, and *Petasites agrestis* Rumpf in the synonymy of *C. buchanani*, but at least 4 of these are regarded by me as *C. speciosissimum*. Van Geert and the Merrill taxon is a valid one. Bakhuizen cites from Java, Sumatra, Banka, Borneo, Celebes, the Moluccas, and New Guinea the following, most of which, at least, probably are *C. speciosissimum* instead: Atasrip 57, Atje 96 & 309, Backer 770, 1850, 6999, 10357, 14379, 23118, & 25464, Bakhuizen 639, 1081, 1115, 1393, & 4047, Boerlage 16, 250, & 410, Blinnemeijer 2426, Cramer 96, Hallier 47, Jacobson 74, 116, & 2660, Jodner 321, Koorders 24453 & 30748, Raap 106, 479, & 667, Robinson 303, Teijsmann 12265, and Van Vuuren 16. Merrill (1921) cites Korthals s.n. from Karimantan and Native collector 437 & 1375 and Herb. Philip. Bur. Sci. 1674 from Sarawak.

Lam (1924) cites *Gibbon* 1201, *Ledermann* 13133, and *Raymundus* 41 from Koror, *Volckens* 130, 157, & 500 from Yap, *Lauterbach* 1193, *Ledermann* 6938 & 10808, and *Schlechter* 14273 & 16402 from northeastern New Guinea, *Dahl* 117 from New Britain, and *Peckel* 197 from New Ireland, but, again, most, if not all, of these specimens are probably *C. speciosissimum*. Bakhuisen (1924) cites *Atasrip* 57, *DeBruyn* 282, and *Teijsmann* 7793 from West Irian, listing the species also from India, Malaya, and the Philippines. In his 1932 work he cites *Brass* 3465 and *Kajewski* 1606 & 2222 from Bougainville, San Cristoval, and Ysabel islands. Wilder (1934) asserts that *C. buchanani* has been introduced on Makatea island and has escaped from cultivation and "may become a troublesome weed." Christophersen (1935) cites *Bryan* 105, *Christophersen* 970, *Eames* 10, and *Garber* 699 as representing what he calls *Clerodendron blumeianum* var. *typicum* from Tau, Upolu, and Savaii islands, but these, instead, probably all are *Clerodendrum speciosissimum*.

Lam & Meeuse (1942) cite *Holtuis* 2485, 3094, & 3414 from Karakelong, Salababoe (cultivated), and Miangas, giving the overall distribution of the species as Sumatra, Banka, Java, Borneo, Celebes, Talaud, the Moluccas, and New Guinea, but it is, again, most probable that the specimens which they cite represent *C. speciosissimum*. Kanehira & Hatusima (1942) cite their no. 12900, giving the species' distribution as Malaya to the Bismark Archipelago, Melanesia, and western Micronesia. Whitmore (1966) cites *Brass* 3140, *Rechinger* 3931, 4077, & 4430, and *Waterhouse* 1/314 from the Solomon Islands; Jiménez (1966) cites *Seibert* 1771 from Haiti; Hartley and his associates (1973) cite nos. 10198 & 10598. Foreman (1972) cites *Kajewski* 1606 & 2222, *Rechinger* 3931, 4077, & 4430, and *Schodde & Craven* 469 from Bougainville island.

In view of the great confusion in literature and herbaria in regard to this taxon, it may be worthwhile to repeat here the original (1832) description of Roxburgh's *Volkameria buchanani*: "Shrubby, erect. Leaves cordate, entire, downy. Corymbs terminal. Calyx shorter than the succulent berries, and reflected back from them. A shrub, received from Dr. Buchanan at Luckipore where the plant is found wild. The same plant was afterwards received from the Moluccas. Flowering time the close of the rains; the seed ripens in January. Stem erect, with few expanding, opposite branches. Young shoots downy, and somewhat four-sided. Leaves opposite, petioled, cordate, entire, downy on both sides, from four to six inches long, and from three to four broad. Corymbs terminal, bearing many, pretty large, deep scarlet coloured flowers. Peduncles and pedicels villous and coloured. Bractes small, coloured, and villous. Calyx five-cleft, small and pretty smooth. Corol; [sic] tube slender, five or six times longer than the calyx, (this mark alone distinguishes it from *Volkameria infortunata*.) Border of five, equal, erect, unilateral divisions. Berry four-lobed, four-celled, sitting on the reflexed, bright red coloured, permanent calyx; when ripe of a dull bluish purple colour." [The fruits, of course, are drupes, not berries].

Hochreutiner (1934) says of his no. 1110 from Java: "Nos spécimens de Java sont identiques au type de l'Herbier de Candolle. Le nom indigène ["tilangit"] nous a été donné par un javanais sur les con-

naissances duquel nous avons quelques doutes. Le spécimen de Samoa qui est peut-être échappé des jardins est une forme plus velue, à panicule plus divariquée. Il semble intermédiaire entre le *C. buehnanani* et le *C. speciosissimum* mais il a le calice réduit du premier."

Nieuwenhuis (1907), speaking of what he calls *C. blumeianum*, says: "Die Nektarien dieser Spezies definieren sich wie bei der vorigen: 1. auf den Blättern, 2. auf den Kelchen (Taf. XXIX, Fig. 78 u. 79). Die Sekretion findet auch hier aus becherförmigen Trichomen statt, doch stehen diese zerstreut auf den Blättern sowohl an der Ober- als an der Unterseite. Es sezernieren die Drüsen der jüngsten und jungen Blätter, sowie die der Knospen und Blüten. Die endständigen, weiss und rosafarbenen Blüten fruktifizieren. Der Ameisenbesuch ist lebhaft. Auf den Blättern verursachen Läuse einigen Schaden, andere Feinde beobachtete ich nicht. Auch diese Art ist nach Angabe von Koorders u. Valetton (Miquel) auf Java heimisch." It would appear that the plant which he is here describing is not *C. buehnanani*.

Clarke (1885) cites the Wallich reference (1831) as "no. 2652" instead of 2653. The Foreman (1972) reference in the bibliography of this species (above) is sometimes cited by the titlepage date of "1971"; similarly, the Lam (1924) reference is sometimes cited as "1925", but the latter is merely the titlepage date for the volume -- the page in question appeared in 1924.

Material of *Clerodendrum buehnanani* has been misidentified and distributed in herbaria as *C. blumeianum* var. *horsfieldii* (Miq.) Kuntze, *C. blumeianum* var. *typicum* H. J. Lam, *C. coccineum* Hort. Morr., *C. infortunatum* L., *C. speciosissimum* Van Geert, and *C. squamatum* Vahl. On the other hand, the Herre 86, distributed as typical *C. buehnanani*, is *C. buehnanani* var. *glabrum* (H. J. Lam) Mold., the Bartlett 6460, 7207, & 7799, Krukoff 4001, Native collector 2013 & 5286, and Toroes 2394, 2528, 2668, 5160, & 16476 bis, distributed as *C. infortunatum* Blume, are actually *C. adenophyllum* H. Hallier, the Toroes 1647 (in part) is a composite, and Biegel 5191, Blume s.n., Christophersen 970, Dugand 4808, Eames 10, Fosberg 58907, Franc 926, Garber 699, Herre 67 & 177, Kanehira 170, 1220, & 2431, Kollmann s.n., Kuntze 4328, Lam 2485 & 3414, J. Scott in South. Rhodes. Govt. Herb. 263465, Takamatsu 1346, and Van Steenis 2383, all distributed as *C. buehnanani*, actually are *C. speciosissimum* Van Geert; Hallier s.n. [17.III.1893] and Koorders s.n., distributed as *C. blumeianum*, are *C. confusum* H. Hallier.

Citations: HISPANIOLA: Haiti: Seibert 1771 (N). LEEWARD ISLANDS: Antigua: Duss 12 (N). Dominica: Cooper 176 (N); Lloyd 685 (N). Guadeloupe: Bailey & Bailey 95 (N); Stehlé 452 (N). WINDWARD ISLANDS: Martinique: Duss 4696 (N); Hahn 541 (B); Oldeman & Maurice M.22 (Cy). PALAU ISLANDS: Koror: Canfield 671 (W--2878735), 725 (W--2881444). GREATER SUNDA ISLANDS: Bata: Raap 667 (Bz--18885). Batu: Raap 106 (Bz--18886). Celebes: Riedel s.n. [1874] (Mu--1389, Mu--1390, Mu--1391). Java: Backer 770 (Bz--18820), 1850 (Bz--18789, Bz--18790), 6999 (Bz--18792, Bz--18793, Bz--18794), 10357 (Bz--18819), 14379 (Bz--18816, Bz--18817, Bz--18818, N), 23118 (Bz--18815), 25464 (Bz--18791), 31159 (Bz--18920, Bz--25491), 34704 (Bz--18795); Bakhuizen 465 (Ut--24883A), 639 (Bz--18787), 1057 (Bz--18784, Bz--18785), 1081 (Bz--18807, Bz--18808), 1115 (Bz--18806), 1393 (Bz--

18804, Bz--18805), 4047 (Bz--18786), 5463 (Bz--18781, Bz--18782, Bz--18783), 6393 (Bz--18813), s.n. (Bz--25489); *Beumée A. 262* (Bz--18780); *Blume s.n.* (L); *Docters van Leeuwen-Reijnvaan 7919* (Bz--18814); *Hal-lier 47* (Bz--18810, Bz--18811); *Herb. Hort. Bot. Jav. s.n.* (Pd); *Hochreutiner 1110* (Ca--41349); *Koorders 24453b* [63*] (Bz--18821, Bz--18811, Bz--18823, Bz--18824), 30748b (Bz--18815); *Lobb 378* (K, Ld--photo, N, N--photo); *Scheffer s.n.* (Bz--18809); *Soegandiredja 85* (Bz--18796, Bz--18797), 129 (Bz--18798, Bz--18799, Bz--18800), 206 (Bz--18801, Bz--18802, Bz--18803); *Van Steenis 166* (Bz--18812), 2383 (Bz--18788). Kalimantan: *Enoch 293* (Bz--73002); *Hallier B. 21* (Bz--18776), B. 114 (Bz--18775, Ca--236926); *Mondi 39* (Bz--18774, N); *Teijsmann s.n.* (Bz--18778, Bz--18779). Kalao-toa: *Docters van Leeuwen-Reijnvaan 1375* (Ut--86738). Kangean: *Backer 27469* (Bz--18828), 27948 (Bz--18826, Bz--18827, Bz--25555). Lingga: *Blinnemeijer 6768* (Bz--18888), 6854 (Bz--18887). Pagi: *Boden-Kloss 14640* (Bz--18889, Ca--286884). Pini: *Raap 479* (Bz--18884). Sarawak: *Kjßberg 173* (Bz--18777, Ca--234206, N); *Native collector 437* (Ph), 1375 (Ph, W--1174113). Siantan: *Van Steenis 802* (Bz--18892, Bz--18893). Siberut: *Iboet 339* (Bz--18891). Sipora: *Iboet 389* (Bz--18890). Sumatra: *Ajoeb 94* (Bz--18880); *Collector undesignated s.n.* (Bz--18874); *Cramer 96* (Bz--18876), 97 (Bz--18877); *Huitema 111a* (Bz--18868); *Iboet 129* (Bz--18872), 177 (Bz--18870, Bz--18871), 342 (Bz--18873); *Jacobson 2660* (Bz--18878, Bz--18879); *Jodner 321* (Bz--18875); *Posthumus 556* (Bz--18866), 713 (Bz--18865); *Van Steenis 3939* (Bz--18861, Bz--18862); *Vates 848* (Bz--18869, Ca--226101, Mi). Toedjoeh: *Blinnemeijer 6018* (Bz--18894). LESSER SUNDA ISLANDS: Banka: *Kobus s.n.* (Bz--18883). Lepar: *Blinnemeijer 2426* (Bz--18882). Tana Djampeja: *Docters van Leeuwen-Reijnvaan 1630* (Ut--86737). Timor: *Walsh 249* (Bz--18835). MOLUCCA ISLANDS: Amboina: *Boerlage 16* (Bz--18836), 250 (Bz--18837), 410 (Bz--18838); *Docters van Leeuwen-Reijnvaan 8661* (Bz--18921); C. B. Robinson 303 (Bz--18841). Ceram: *Kornassi 1304* (Bz--18843); *Rutten 412* (Bz--18845). Mangole: *Bloembergen 4579* (Bz--18847). Sanana: *Bloembergen 4307* (Bz--18849, Bz--18850), 4391 (Bz--18848). Taliboe: *Atje 309* (Bz--18851, Bz--18852, Bz--18853). Tanimber: *Buwalda 4313* (Bz--72576, Bz--72577). AROE ISLANDS: Kobroër: *Buwalda 4991* (Bz--72730, Bz--72731). NEW GUINEA: Northeast New Guinea: *Es-sig LAE.55013* (Ba); *Schlechter 16402* (S). Papua: *Armit s.n.* [Mt. Goodenough, 1895] (Mb); *Carr 12853* (N); *Sayer s.n.* [1887] (Mb). West Irian: *Aet 181* (Bz--72952), 178 (Bz--72953, Bz--72954); *Anta 36* (Bz--72741). NEW GUINEAN ISLANDS: Goodenough: *Brass 24446* (Ng--17161). SOLOMON ISLANDS: Bougainville: *Frizzi s.n.* [1911/12] (Mu); *Kusche s.n.* [Nov. 1 -- Dec. 28, 1920] (Gg--34497). CULTIVATED: England: *Hort. Bot. Reg. Kew. s.n.* [1896] (K); *Sander & Sons s.n.* [18 May 1906] (K, K). Guadalupe: *Duss 2395* (K). Java: *Herb. Hort. Bogor. 25488* (Bz), XV.K.A.XVII.10 (Bz--26459). LOCALITY OF COLLECTION UN-DETERMINED: *Collector undesignated 1078* (Ut--86738); *Thunberg s.n.* (S).

CLERODENDRUM BUCHANANI f. ALBUM Mold., Phytologia 4: 45. 1952.

Synonymy: *Clerodendron buchanani* flore albo Bakh., in herb. *Clerodendron blumeianum* flore albo Backer, in herb.

Bibliography: Mold., Phytologia 4: 45. 1952; Mold., Fifth Summ. 1:

321 (1971) and 2: 862. 1971; Mold., Phytol. Mem. 2: 312 & 534. 1980.

This form differs from the typical form of the species in having white corollas.

The form is based on *Posthumus* 730 from near Bangko, at an altitude of 180 m., Sumatra, collected on August 18, 1925, and deposited in the Buitenzorg herbarium.

Material of this taxon has been distributed in some herbaria as typical *C. buchanani* (Roxb.) Walp. It has been collected at altitudes from sealevel to 1000 m., in flower in August and October.

Citations: GREATER SUNDA ISLANDS: Sumatra: *Ajoeb* 116 (Bz--18881); *Posthumus* 730 (Bz--18867--type, Ld--photo of type, N--photo of type). MOLUCCA ISLANDS: Ceram: *Rutten* 259 (Bz--18844).

CLERODENDRUM BUCHANANI f. *BREVIFLORUM* Mold., Phytologia 4: 45--46. 1952.

Bibliography: Mold., Phytologia 4: 45--46. 1952; Mold., Fifth Summ. 1: 329 (1971) and 2: 862. 1971; Mold., Phytol. Mem. 2: 320 & 534. 1980.

This form differs from the typical form of the species in having its corolla-tubes only 1 cm. long or less during anthesis.

The form is based on *Rensch-Maier* 294 from Sembaloen, Lombok, in the Lesser Sunda Islands, collected on April 7, 1927, and deposited in the Buitenzorg herbarium.

The form is known thus far (to me) only from the original collection.

Citations: LESSER SUNDA ISLANDS: Lombok: *Rensch-Maier* 294 (Bz--18902--type, Ld--photo of type, N--photo of type).

CLERODENDRUM BUCHANANI var. *GLABRUM* (H. J. Lam) Mold., Phytologia 4: 46. 1952.

Synonymy: *Clerodendron blumeianum* var. *glabrum* H. J. Lam, Verbenac. Malay. Arch. 302. 1919.

Bibliography: H. Hallier, Meded. Rijks Herb. Leid. 37: 79--80. 1918; H. J. Lam, Verbenac. Malay. Arch. 302. 1919; Fedde & Schust., Justs Bot. Jahresber. 60 (2): 572. 1941; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 147, 148, & 180. 1949; Mold., Résumé 194, 197, 198, 205, & 448. 1959; Mold., Fifth Summ. 1: 322, 329, 331, & 341 (1971) and 2: 862. 1971; Mold., Phytol. Mem. 2: 312, 320, 322, 330, 384, & 534. 1980; Mold., Phytologia 58: 196. 1985.

This variety differs from the typical form of the species in having the adult leaf-blades glabrous or subglabrous on both surfaces.

Lam (1919) cites no type for this variety, but indirectly cites *Elbert* 901, 968, 1006, 1684, 1740, 1812, 1836, & 1882 from Lombok, 3982 from Sumbawa, 4510 & 4567 from Wetar, and *Herb. Lugd.-Bat.* 8:n. from Banda.

Collectors have found this plant growing from sealevel to 1650 m. altitude, in flower in April, June, July, October, and November, and in fruit in April, describing it as 1.5 m. tall. The corollas are said to have been "red" on *Voogd* 2042, "rose" on *Rensch* 144, "cinnebar-red" on *Rensch* 1266, and "purple-red" on *Bloembergen* 4136.

The *Herre* 86, cited below, bears a label giving Espiritu Santo as the locality of collection and another label giving "Malekula Island"

as the locality.

Material of this taxon has been misidentified and distributed in some herbaria as typical *C. buchanani* (Roxb.) Walp. or as *C. blumea-num* Schau., *C. fallax* Lindl., and *C. squamatum* Vahl.

Citations: GREATER SUNDA ISLANDS: Celebes: *Bloembergen* 4136 (Bz--20958); *Noerkas* 16 (Bz--18855, Bz--18856); *Teijsmann* 12265 (Bz--18854). LESSER SUNDA ISLANDS: Bali: *Voogd* 2042 (Bz--18830). Flores: *Posthumus* 3303 (Bz--20621, Bz--20622); *Rensch* 1266 (Bz--18831). Lombok: *Rensch* 144 (Bz--18901); *Voogd* 2712 (Bz--18834). Wetar: *Bloembergen* 3574 (Bz--72644). MOLUCCA ISLANDS: Amboina: *Saanan* 96 (Bz--18839, Bz--18840). Buru: *Rant* 512 (Bz--18848). NEW HEBRIDES: Espiritu Santo: *Herre* 86 [Malekula] (N).

CLERODENDRUM BUCHHOLZII Gürke, Engl. Bot. Jahrb. 18: 176--177 [as "*Clerodendron*"]. 1893; B. Thomas, Engl. Not. Jahrb. 68: 69 & 95. 1936.

Synonymy: *Clerodendron buchholzii* Gürke, Engl. Bot. Jahrb. 18: 176. 1893. *Clerodendron preussii* Gürke, Engl. Bot. Jahrb. 18: 175. 1893. *Clerodendron kentrocaule* J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 296. 1900. *Siphonanthus costulata* Hiern, Cat. Afr. Pl. Coll. Welw. 4: 843. 1900. *Clerodendron costulatum* K. Schum. apud Prain, Ind. Kew. Suppl. 3: 44 in syn. 1900. *Clerodendron buchholzii* Gürke apud J. H. Holland, Kew Bull. Addit. Ser. 9 [Useful Pl. Nigeria 3]: 523. 1915. *Clerodendron schifferi* A. Chev., Expl. Bot. Afr. Occ. Franç. 1: 509 nom. nud. 1920. *Clerodendron buchholzii* Gürke apud Bakh. in Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: viii. 1921. *Clerodendron kentrocaule* Baker apud B. Thomas, Engl. Bot. Jahrb. 68: 69 in syn. 1936. *Clerodendron preussii* Gürke apud B. Thomas, Engl. Bot. Jahrb. 68: 69. 1936. *Clerodendron schifferi* A. Chev. apud B. Thomas, Engl. Bot. Jahrb. 68: 91. 1936. *Clerodendron buchholzii* Gürke ex Mold., Alph. List Cit. 4: 1153 sphalm. 1949. *Clerodendron buchholzii* Gledhill, Check List Flow. Pl. Sierra Leone 30. 1962. *Clerodendron buchholtzii* Gürke ex Richards & Morony, Check List Fl. Mbala 236. 1969. *Clerodendron buchholtzii* Gürke ex Mold., Fifth Summ. 1: 460 in syn. 1971.

Bibliography: Gürke, Engl. Bot. Jahrb. 18: 175--177. 1893; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 293, 294, 296--297, 301, 302, & 515. 1900; Durand & DeWild., Compt. Rend. Soc. Bot. Belg. 39: 75. 1900; Durand & DeWild., Mat. Fl. Congo 23. 1900; Gürke, Engl. Bot. Jahrb. 18: 176--177, 192, & 292. 1900; Hiern, Cat. Afr. Pl. Coll. Welw. 4: 843. 1900; K. Schum., Justs Bot. Jahresber. 28 (1): 495 & 496. 1900; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 101. 1901; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 172. 1904; Prain, Ind. Kew. Suppl. 3: 44. 1908; DeWild., Ann. Mus. Cong. Belg. Bot., ser. 5, 3: 467--468. 1912; Holland, Kew Bull. Misc. Inf. Addit. Ser. 9 [Useful Pl. Nigeria 3]: 523. 1915; S. Moore, Journ. Bot. Brit. 54: 290. 1916; Wernh., Journ. Bot. Brit. 54: 230. 1916; A. Chev., Expl. Bot. Afr. Occ. Franç. 1: 509. 1920; DeWild., Bull. Jard. Bot. Brux. 7: 165. 1920; Bakh. in Lam & Bakh., Bull. Jard. Bot. Buitenz., ser. 3, 3: 95, 108, & viii. 1921; DeWild., Pl. Bequaert. 2: 258 & 264. 1922; Good & Exell, Journ. Bot. Brit. 68, Suppl. 2: 140. 1930; Irvine, Pl. Gold Coast 108. 1930; Hutchins. & Dalz., Fl. W. Trop. Afr., ed. 1, 2: 273

& 275. 1931; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 8, 11--13, 15, 18, 26, 40, 69, & 92. 1936; Dalz., Useful Pl. W. Trop. Afr. 454. 1937; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 2, 101. 1941; Mold., Alph. List Inv. Names 17, 18, 20, 21, & 56. 1942; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 46--48, 50, & 89. 1942; Mold., Phytologia 2: 98. 1945; Mold., Alph. List Cit. 2: 504. 1948; H. N. & A. L. Mold., Pl. Life 2: 52. 1948; Mold., Alph. List Cit. 3: 828 & 963 (1949) and 4: 1153. 1949; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 111--114, 118, & 180. 1949; Metcalfe & Chalk, Anat. Dicot. 1037. 1950; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 3, 101. 1959; Mold., Résumé 136--141, 143, 146, 261, 262, 272, & 448. 1959; Dale & Greenway, Kenya Trees 582. 1961; Hansford, Sydowia Ann. Myc., ser. 2, Beih. 2: 689. 1961; Irvine, Woody Pl. Ghana 750--752, pl. 32. 1961; Gledhill, Check List Flow. Pl. Sierra Leone 30. 1962; H. Huber in Hutchins. & Dalz., Fl. W. Trop. Afr., ed. 2, 440, 441, & 443. 1963; Nielsen, Introd. Flow. Pl. W. Afr. 164. 1965; Bouquet, Invent. Pl. Méd. Tox. Cong. Braz. 32. 1967; Mold., Résumé Suppl. 15: 14 & 18. 1967; Richards & Morony, Check List Pl. Mbala 236. 1969; Gillett, Numb. Check-list Trees Kenya 46. 1970; Mold. in Menninger, Flow. Vines 333. 1970; Mold., Fifth Summ. 1: 215--217, 219--221, 223, 225, 226, 228, 233, 242, 245, 440, 442, 448, 454, 460, & 463 (1971) and 2: 621 & 862. 1971; Jaeger & Mold., Phytologia 30: 389--391. 1975; Jaeger, Marcellia 39: 15--19, fig. 1--4. 1976; Mold., Phytologia 46: 187. 1980; Mold., Phytol. Mem. 2: 206, 207, 210, 212, 213, 215--218, 223, 224, 230, 232, 235, 383, 390, & 534. 1980; Mold., Phytologia 50: 250 (1982) and 58: 206. 1985.

Illustrations: Irvine, Woody Pl. Ghana pl. 32 (a). 1961; Jaeger, Marcellia 39: 15--17, fig. 1 & 2. 1976.

A subshrub or more usually a large, glabrous, sun-loving, high-climbing, woody vine or liana, quite ornamental, 2--33 m. tall, often climbing over tall trees; stems 1.8--3 cm. in diameter, often hollow, thorny, sometimes procumbent and rooting; wood hard; sap colorless; pith septate; larger branches mostly very conspicuously long-spinose, sometimes procumbent; lenticels prominent; petiolar spines large, woody; leaves opposite or subopposite, deciduous; petioles elongate, 2--4 cm. long or longer, articulate, glabrous (or puberulent on the upper margins), basally woody, the base persisting as a spine; leaf-blades thin-membranous or papery, fragile in drying, oblong or ovate-lanceolate to elliptic, broadly elliptic, or ovate to ovate-elliptic, 7.5--20 cm. long, 3--10 cm. wide, apically acuminate, marginally entire, basally obtuse or rounded to narrowly cuneate, completely glabrous on both surfaces, minutely punctate beneath, somewhat glossy and medium-green above, dull and paler beneath; secondaries 5 or 6 pairs, impressed above, prominulent beneath, looping near the margins; inflorescence axillary and terminal, frequently cauliflorous at or near the base of the stem, often also borne on thick leafless branches and older wood or on leafy twigs, cymose, panicleate, to 17.5 cm. long; peduncles 6--12 mm. long, glabrous; pedicels 3--5 mm. long, glabrous; bractlets minute, filiform or subulate, usually 2--3 mm. long, glabrous; cymules dense, borne laterally on a central rachis 5--30 cm. long, forming an elongate, leafless, many-flowered, thyrsoid panicle, the individual cymules 5--7-flowered; flowers frag-

rant or odorless depending on time of day, handsome, rather crowded in the cymules; calyx campanulate to narrow-tubular or infundibular, gradually ampliate from base to apex, 5--8 mm. long, green or pale-green, externally glabrous, apically 4--6 mm. wide, the tube usually 3--5 times as long as the teeth, the rim shortly 5-toothed, the teeth deltoid-triangular or ovate, very small, apically acute, basally about 2 mm. wide; corolla white, tubular-hypocrateriform, the tube slender, 1.2--2.5 cm. long, 1.2--3 times longer than the calyx, externally glabrous, the limb 5-parted, slightly hooded, the lobes slender, 4--5 mm. long, glabrous, eventually reflexed; stamens 4, about twice as long as the corolla-lobes, exerted about 1.5 cm. from the corolla-mouth; filaments white; style exerted about 1.5 cm.; fruiting-calyx accrescent, cupuliform, white or whitish, inflated, enclosing the fruit; fruit oblong or subcylindric-conic, drupaceous, at first greenish, then red, finally black, shiny, 2- or 3-celled, usually 2-seeded.

Collectors have found this plant growing in high, dense, secondary, riverine, and gallery forested plateaus, in virgin forests of *Scorodophloeus zenkeri* on terra firma, on steep banks, in rocky gullies, and in tangled undergrowth, at 940--2100 m. altitude, in flower from January to December, in fruit in January, April, October, and November. Onochie reports finding it in the shade of *Albizia zygia* and notes that the "petals grow after pollination up to twice as long".

Vernacular names reported for this species are "bakoréné", "bompoutou", "bomputu", "botújwá-boséséke", "boundou", "elià", "fafa-hinei". "fafa", "gwendji", "ifonge", "imbambake e boliki", "male", "mbambake e boliki", "mosongo-songo", "mushitu", "taasendua", "yongongo", and "bakorene guéna".

The chopped-up leaves of this plant are mixed with food by natives to stimulate the appetite, while the dried leaves are smoked as a tobacco substitute. Dalziel (1937) and Irvine (1961) report that "The leaves are crushed, warmed, and rubbed on the body in the Cameroons area for rheumatism. The leaves, with others, are used for snake-bite....A leaf infusion, with pepper, is used for cold in the chest" in Ghana. DeWildeman (1912) tells us that the thorns are often employed as fish-hooks.

The flowers of this species are often galled by a species of *Paracopium*, as illustrated by Jaeger (1976) and as seen on *Tanner R.T.4941*. The insect involved is a member of the *Heteroptera* whose imago stage is frequently present in the parasitized corollas. "The action of the parasite produces striking changes in the perianth and reproductive organs" of the host plant. The normal, narrow, tube-like corolla loses its verbenaceous appearance, changing into a broadly cylindric-campanulate organ about 2 cm. long and 1--1.5 cm. wide, the lobes becoming semi-elliptic and 5--7 mm. long, thus resembling the flower of *Digitalis purpurea*. The reproductive organs are also deeply modified and become sterile.

Hansford (1961) reports the fungus, *Meliola clerodendri* Hansf., as parasitizing *Clerodendrum buchholzii* in Sierra Leone and Ghana, based on *Deighton 496, 1553, 1824, CB.758, & CB.872*.

Wood samples accompany *Breteler 2152* in several herbaria.

Clerodendrum buchholzii was based by Gürke (1893) on *Buchholz s.n.* and *Preuss 404 & 497* from the Cameroons and on *Mechow 86* from Angola, the first of these from Victoria (collected in September 1873), the second from brushwood between Barombi Station and Kumba, collected on August 22, 1890, the third from the North Bay of Elephant Lake, collected on September 8, 1890, and the last from Pungo Andongo, collected between January and April of 1879, all deposited in the Berlin herbarium, now destroyed. The first mentioned probably should be regarded as the type collection. Gürke comments that "Diese Art ist hauptsächlich durch den lianeartigen Stamm, die lockeren, regelmässig walzenförmigen Rispen und den trichterförmigen Kelch charakterisiert".

Clerodendrum preussii is based on *Preuss 1008* from brushwood along a brook in the lower half of the bathing resort at Ober-Buea, Cameroons, at 940 m. altitude, collected on September 29, 1894. Gürke (1893) comments that "Diese Art ist mit *C. Buchholzii* nahe verwandt. Sie unterscheidet sich durch die mehr eiförmigen Blätter, durch die meist achselständigen Cymen, welche dort stets zu endständigen oder aus dem alten Holz hervorbrechenden Rispen vereinigt sind, ferner durch die dünneren Blütenstiele, die kleineren Kelche und schwächeren Blumenkronenröhren; auch sind hier die Kelche röhrenförmig und nur an der Spitze glockig verbreitert, während sie bei *C. Buchholzii* von der Basis an sich allmählich trichterförmig erweitern". Thomas (1936) still keeps the two taxa separate, distinguishing them as follows:

"Kelch parallelwandig, 1/5 gespalten, Zipfel nicht abstehend; Blütenstand meist kauliflor; Blätter bis 30 cm lang".....*C. buchholzii*.

"Kelch gegen Spitze erweitert, 0,6--0,8 cm lang, Zipfel etwas abstehend; Zipfel grösser als bei voriger Art; Blätter bis 15 cm lang, eilänglich; im Blütenstand vereinzelt grosse Laubblätter"..
C. preussii.

For the former taxon he cites from Cameroons: *Buchholz s.n.*, *Busse 3195*, *Blüsgen 84*, *Deistel 158*, *Jungner 259*, *Ledermann 6356*, *Mildbraed 10507*, *Preuss 404 & 497*, *Winkler 215*, and *Zenker 1078*; from Fernando Po: *Mildbraed 6259 & 6442*; and from Angola: *Nolde 271*. For *C. preussii* he cites from Cameroons: *Deistel 64*, *Ledermann 1883*, *5840*, & *5888*, and *Preuss 1008*, and from Annobon: *Exell 873*. In some of my previous notes *C. preussii* was regarded as a synonym of *C. silvaeanum* Henriq. Bakhuizen (1921) asserts that, in his opinion, *C. buchholzii* is conspecific with *C. manetti* Vis., *Sem. Hort. Patav. 2: 120, pl. 3 (1848--1849)*, which, if true, would require *C. manetti* to become the accepted name for what we now know as *C. buchholzii* due to reasons of priority. I have as yet not seen the type of *C. manetti*. *Clerodendrum preussii* var. *silvaeanum* (Henriq.) Thomas is regarded by me as a synonym of *C. silvaeanum* Henriq.

Moore (1916) asserts that *C. buchholzii* resembles *C. validipes* S. Moore, but the latter has the corolla-tube scarcely longer than the calyx, the petiole-bases are persistent, and the leaves are often subopposite or alternate. Wernham (1916) opines that it is related to *C. chamaeriphes* Wernh., which has relatively much longer corolla-tubes.

It is worth noting here that Thomas (1936) cites the Gürke (1893)

reference as "1900" in error, while Baker (1900) cites the Hiern (1900) reference as "1.843". He cites *Preuss* 940 & 1008 as representing *C. preussii* from Cameroons; *Bates* 473, *Buchholz* s.n. and *Preuss* 404 from Cameroons and *Mzchow* 86 from Angola for *C. buchholzii*, also commenting that "This may be identical with *C. Manetti*, Vis. III. Plante Orto Padova, iii. (1856) 20, t. 3, a garden plant of uncertain origin". For *C. kentrocaule* he cites only the type collection, *Welwitsch* 5682, from Pungo Andongo, Angola. He separates his three proposed taxa as follows:

1. Flowers small, $\frac{1}{2}$ inch long.....*C. kentrocaule*.
1a. Flowers large, over $\frac{1}{2}$ inch long.

2. Leaf-blades oblong.....*C. buchholzii*.

2a. Leaf-blades ovate.....*C. preussii*.

It should be noted that the characters he uses are not at all the ones that Thomas (1936) uses (see above).

Another key which sometimes proves helpful in distinguishing *C. buchholzii* from some of its relatives is the following:

1. Leaf-blades always marginally entire.

2. Inflorescence mostly cauliflorous at or near the base of the stems; larger branches mostly very conspicuously long-spiny; leaves mostly glabrous.

3. Calyx narrow-elongate, 6--8 mm. long; leaf-blades thin-membranous, fragile.

4. Petioles short, 5--18 mm. long, entirely glabrous; calyx glabrous.....*C. silvestre*.

4a. Petioles elongate, to 4 cm. long or longer, pubescent at least on the upper margins; calyx puberulous...*C. buchholzii*.

3a. Calyx broadly obconic; leaf-blades somewhat leathery, not fragile.....*C. laxicymosum*,

2a. Inflorescence plainly axillary or terminating the branchlets.

5. Leaf-blades mostly leathery, glabrous; branches very conspicuously long-spiny.

6. Inflorescence congested, often subcapitate; calyx about 5 mm. long, nigrescent; veinlet reticulation mostly flat above...

C. botryodes.

6a. Inflorescence very loose; calyx about 7 mm. long, not nigrescent, stramineous; veinlet reticulation mostly prominent on both surfaces.....*C. laxicymosum*.

1a. Leaf-blades mostly more or less marginally dentate.....

C. tanganyikense.

Gürke (1900) comments in his discussion of *C. thonneri*: "Am nächsten steht die Art dem *Cl. Preussii* Gürke und *Cl. Buchholzii* Gürke, mit denen sie in der Grösse und Form des Kelches, in den Grössenverhältnissen der Blumenkrone und im allgemeinen auch in der Form und Kahlheit der Blätter übereinstimmt. *Cl. Preussii* Gürke hat aber sehr lockere Blütenstände und ist auch ein bis 15 m hoch kletternde Liane. *Cl. Buchholzii* Gürke ist zwar ebenfalls strauichig; ihre viel grösseren lockenen Rispen entspringen aber meist dicht über dem Erdboden aus dem Stamm; auch scheinen ihre Kelchzipfel etwas länger und ihre Blumenkronenröhren im allgemeinen etwas kürzer zu sein als bei der vorliegenden neuen Art."

Chevalier (1920) records *C. buchholzii* from French Guinea and Iv-

ory Coast. Richards & Morony (1969) cite Bull 2618, Fanshawe 5629, and Richards 9582 & 22176 from Mbala. Irvine (1961) cites Fishlock s.n., Gould s.n., Irvine 68, 866, 2552, & 3535, Johnson 169, 462, & 771, and Vigne 3386 & 4256 from Ghana. He gives the overall distribution of the species, as regarded by him, as "Guinea to Gaboon, Angola, and Uganda", referring to the plant as "An ornamental climber sometimes cultivated".

Hutchinson (1931) distinguishes *C. buchholzii* from its closest large-flowered relatives as follows:

1. Calyx about 1 cm. long.....*C. umbellatum*.
- 1a. Calyx at most 8 mm. long.
2. Calyx-lobes narrow-lanceolate.....*C. splendens*.
- 2a. Calyx-lobes short-triangular.
3. Calyx tubular, 8 mm. long; flowers rather crowded in the cymules; corolla-tube glabrous.....*C. buchholzii*.
- 3a. Calyx short and cupular, 3--4 mm. long; flowers lax, the ultimate pedicels about 2 cm. long; corolla-tube pubescent....
C. bipindense.

Huber (1963) cites for *C. buchholzii* - Caille in Chevalier 14899 & 15049 from Guinea; Deighton 2358 & 2530, Jaeger 1634, Jordan 124, and Thomas 1921 from Sierra Leone; Baldwin 7082 and Linder 184 & 730 from Liberia; Chevalier 16009, 15010, 19320, & 20160 from Ivory Coast; Darko WACRI.946, Gould s.n., Johnson 169 & 771, and Vigne FH. 4256 from Ghana; Jones FHI.6721, Latilo FHI.31876, Moses & Jonathan FHI.19181, Punch s.n., and Talbot s.n. from Southern Nigeria; Hutchinson & Metcalfe 5, Keay FHI.28580, Maitland 311, Mildbraed 10507, Okorunfemi FHI.30520, and Onochie FHI.34838 from Cameroons; and Boughiey 62, Guinea 424, Vogel 157, and Wrigley 684 from Fernando Po, giving its overall distribution as also including Gabon, Zambia, Angola, and "E. Africa".

Hutchinson & Dalziel (1931) cite Chevalier 14809, 15049, 16009, 16010, 19320, & 20150, Deighton 1370, Holland 233, Johnson 169, 462, & 771, Linder 252 & 730, Mildbraed 10507, Punch s.n., Thomas 1921, and Williams 40 from French Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Southern Nigeria, and Cameroons.

DeWildeman (1922) cites Bequaert 6438 from lower Middle Congo and in his 1912 work Jespersen s.n. and Malchior 379. Irvine (1930) cites his no. 866 from Ghana, where, he says, the plant occurs in secondary forests. Nielsen (1965) also asserts that the species is often seen in secondary forest growth. Good & Exell (1930) cite their nos. 1054 & 7506; Jaeger & Moldenke (1975) cite Jaeger 1634 & 1698 and Adam 22640.

The Louis 6365 collection (in flower), cited below, and 7152 (in fruit) are said to have been taken from the same plant.

Material of *C. buchholzii* has been misidentified and distributed in some herbaria as *C. bakeri* Gürke, *C. schweinfurthii* Gürke, *C. thonneri* Gürke, and even *Polyalthia* sp. On the other hand, the Baldwin 7082 and Vigne 3386, distributed as *C. buchholzii*, actually are *C. botryodes* (Hiern) J. G. Baker, Chandler 1587 is *C. laxicymosum* DeWild., Leonard 485 and Nannan 150 are *C. thonneri* Gürke, Hulstaert 1170 is a mixture with *C. triplinerve* var. *sulcatum* (Thomas) Mold., Gossweiler 14054 is *Kalaharia uncinata* (Schinz) Mold., and

Dunner 19 and Zenker 2841 are mixtures with something not verbenaceous.

Citations: NIGERIA: *Onochie* A.39/46 [FHI.7543] (B). CAMEROONS: *Breteler* 2152 (Mu); *Gocker* 69 (W--1051345); *Jungner* 259 (S); *Pneuss* 404 (L, Ld--photo, Mu, N--photo, S, W--813842), 1008 (L); *Staudt* 440 (L); *Zenker* 131 (Gg--151084, N, W--1178265), 1075 (S), 1694 (L, Mu--3716), 2047 (L, Mu--3776), 2843 (Mu--4003), 4391 (L), s.n. [Bipindi] (Ca--620050). ZAIRE: *Butayer* 2326 (Br); *Corbisier* 109 (Br); *DeGiorgi* 1400 (Br), 1407 (Br, N); *Dunner* 19 in part (Br); *Hulstaert* 1107 in part (Br); *Jespersen* s.n. [1910] (Br); *Lebrun* 4140 (Br, Br, N); *J. Leonard* 485 (Br, N); *Louis* 525 (Br, N), 6365 (Br, W--2090996), 7152 (Br); *Malchior* 379 (Br); *Mortehan* 486 (Br); *Mullenders* 493 (Br, Br, Br), 2328 (Br); *Nannan* 120 (Br); *Putman* 120 (Br); *Scaetta* 852 (Br); *Schoutenden-Wery & Poma* 151 (Br); *Taton* 392 (Br, Br); *Van der Ben* 776 (Mu); *Wellens* 296 (Br); *Zenker* 2841 in part (Br). BURUNDI: *Reekmans* 7778 (Ac). UGANDA: *Bagshawe* 1269 (W--1349162). TANZANIA: *Tanganyika*: *Tanner* R.T.4941 (Ba), 4942 (Ba). ZAMBIA: *LRLCS*.22176 (N). MOUNTED ILLUSTRATIONS: *Jaeger*, *Marcellia* 39: 15--17, fig. 1 & 2. 1976 (Ld).

CLERODENDRUM BUCHHOLZII var. *PARVIFLORUM* Thomas, Engl. Bot. Jahrb. 68: [Gatt. *Clerod.*] 69. 1936.

Bibliography: B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. *Clerod.*] 69. 1936; Mold., *Known Geogr. Distrib. Verbenac.*, ed. 1, 50 & 89 (1942) and ed. 2, 118 & 180. 1949; Mold., *Résumé* 146 & 448. 1959; Mold., *Fifth Summ.* 1: 242 (1971) and 2: 862. 1971; Mold., *Phytol. Mem.* 2: 232 & 534. 1980.

This variety differs from the typical form of the species in having smaller flowers, often only 1 cm. long in all.

The variety is based on *Mechow* 86 from Pungo Andolgo, Angola, collected on April 1, 1919, and deposited in the Berlin herbarium, now destroyed. Thomas (1936) cites also *Gossweiler* 1054 from Malange, Angola.

Nothing is known to me of this taxon except what is stated in the bibliography.

CLERODENDRUM BUCHNERI Gürke, Engl. Bot. Jahrb. 18: 172--173 [as "*Clerodendron*"]. 1893; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. *Clerod.*] 37, 64, & 92. 1936.

Synonymy: *Clerodendron buchneri* Gürke, Engl. Bot. Jahrb. 18: 172. 1893. *Clerodendron strictum* J. G. Baker ex Hiern, Cat. Afr. Pl. Coll. Welw. 1: 840--841 in syn. 1900; J. G. Baker in *Thiselt.-Dyer*, Fl. Trop. Afr. 5: 305. 1900. *Siphonanthus cuneifolia* (Baker) Hiern, Cat. Afr. Pl. Coll. Welw. 1: 841. 1900. *Siphonanthus stricta* (Baker) Hiern, Cat. Afr. Pl. Coll. Welw. 1: 840. 1900. *Clerodendron cuneifolium* (Hiern) J. G. Baker in *Thiselt.-Dyer*, Fl. Trop. Afr. 5: 305. 1900. *Clerodendron cuneifolium* Bak. apud K. Schum., *Justs Bot. Jahresber.* 28 (1): 496. 1902. *Siphonanthus stricta* Hiern apud *Thiselt.-Dyer*, Ind. Kew. Suppl. 2: 172. 1904. *Siphonanthus cuneifolia* Hiern apud *Thiselt.-Dyer*, Ind. Kew. Suppl. 2: 172. 1904. *Clerodendron hockii* DeWild., Bull. Jard. Bot. Brux. 3: 266--267. 1911. *Clerodendrum strictum* Baker apud B. Thomas, Engl. Bot. Jahrb. 68:

[Gatt. Clerod.] 64 in syn. 1936. *Clerodendrum cuneifolium* Baker apud B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 64 in syn. 1936. *Clerodendrom buchneri* Gürke ex Astle, Kirkia 7: 89 sphalm. 1968.

Bibliography: Gürke, Engl. Bot. Jahrb. 18: 172--173. 1893; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 294, 305--307, & 518. 1900; Hiern, Cat. Afr. Pl. Coll. Welw. 1: 840--841. 1900; K. Schum., Justs Bot. Jahresber. 28 (1): 495 & 496. 1900; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 101. 1901; Gürke in Warburg, Kunene-Sambesi Exped. 351. 1903; Hegi in Warburg, Kunene-Sambesi Exped. 443. 1903; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 43 & 172. 1904; DeWild., Bull. Jard. Bot. Brux. 3: 266--267. 1911; Fedde & Schust., Justs Bot. Jahresber. 40 (2): 335. 1915; Good & Exell, Journ. Bot. Brit. 68. Suppl. 2: 141. 1930; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 37, 64, 92, 93, & 96. 1936; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 2, 101. 1941; Mold., Alph. List Inv. Names 17, 18, 20, 140, & 141. 1942; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 48--50 & 89. 1942; H. N. & A. L. Mold., Pl. Life 2: 52. 1948; Mold., Alph. List Cit. 3: 824. 1949; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 115, 116, 118, 119, & 180. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 3, 101. 1959; Mold., Résumé 141, 143, 146, 148, 151, 262, 264, 270, 344, & 448. 1959; F. White, For. Fl. North. Rhodes. 365 & 367. 1962; Astle, Kirkia 7: 89. 1968; Mold., Résumé Suppl. 16: 7 & 14. 1968; Richards & Morony, Check List Fl. Mbala 236. 1969; Mold., Fifth Summ. 1: 228, 232, 235, 242, 245, 247, 253, 438, 443, 446, & 456 (1971) and 2: 662 & 862. 1971; Lewalle, Bull. Jard. Bot. Nat. Belg. 42 [Trav. Univ. Off. Bujumb. Fac. Sci. C.20]: [230]. 1972; Malaisse in Lieth, Phenol. Season. Model. 276 & 438. 1974; F. White, Gard. Bull. Singapore 29: 69. 1977; Mold., Phytol. Mem. 2: 218, 222, 224, 232, 235, 236, 242, 437, & 534. 1980.

An erect herbaceous perennial or small shrub, rhizomatous, mostly few-stemmed, sometimes bushy, 0.3--1.2 m. tall; rootstocks deep, woody, horizontal; stems herbaceous or somewhat woody, virgate, erect, pubescent; young branches puberulent; leaves mostly alternate or approximate, sometimes opposite, close, ascending, bright-green; petioles short, only 5--10 mm. long; leaf-blades subcoriaceous, obovate-cuneate or obovate-lanceolate to oblong, 7--15 cm. long, 2--4 cm. wide, apically short-acuminate or cuspidate, marginally irregularly repand on the upper half, basally entire and cuneate or obtusely attenuate, glabrous or subglabrescent above (when mature), puberulent and reticulate-venose beneath, the puberulence principally on the venation; inflorescence terminal, capitate, bracteate, mostly dark-red or purple in the fruiting stage; cymes globose, dense, many-flowered, sessile or subsessile to short-pedunculate; outer bracts foliaceous, similar in form to the uppermost leaves and surpassing them, oblong-lanceolate, about 35 mm. long and 15 mm. wide, apically mucronate, marginally entire, basally attenuate, glabrous above, puberulent beneath; bractlets shorter than the bracts, lanceolate, mostly 8--10 mm. long and only 1--3 mm. wide, apically long-acuminate, basally attenuate, the inner ones gradually smaller; flowers subsessile or short-pedicellate, the stalk much shorter than the subtending bractlet, sometimes galled; calyx tubu-

lar-cyathiform, 1.7--2 cm. long, externally pubescent, deeply 5-parted, often reddish or brown, the tube small and very short, the lobes large, foliaceous, ovate or ovate-lanceolate, 5--6 mm. wide, apically acute or acuminate, somewhat thin-textured so that the venation is plainly prominulous; corolla white or cream-color, long-tubular, the tube slightly incurved, 4--9 cm. long, apically inflated, sometimes greenish-white, externally glandulose and sparsely long-pubescent, the 5 lobes unequal or subequal, 8--15 mm. long; stamens 2.5--3.5 cm. long, very long-exserted; anthers yellow; pistil 10--11 cm. long; fruit drupaceous, 4-lobed, at first green, finally black and shiny; seeds with a red or orange aril.

The species is based on *Buchner* 572 from the Malange district, Angola, collected on April 12, 1881, and deposited in the Berlin herbarium, now destroyed. Gürke (1893) cites also *Mechow* 129 & 557a in his original publication, but the Buchner collection was designated as the type by Thomas in 1936. Gürke comments: "Von *C. capitatum* Schum. et Thonn. durch die kürzer gestielten, schmälere, meist in der Stiel verschmälerten Blätter verschieden". *Clerodendron cuneifolium* was based by Baker (1900) on *Welwitsch* 5684 from the province of Pungo Andongo, Angola, and *C. strictum* was based by him on *Welwitsch* 5685 from the same locality; *C. hockii* was based on *Hock s.n.* from Zaire.

Siphonanthus cuneifolia and *S. stricta* were both based by Hiern (1900) on Baker manuscript names in *Clerodendron* given by Hiern in synonymy. Baker, on the other hand, in his work in the same year does not cite the Hiern names. The Hiern work is sometimes cited as volume "4", but appears to be only part 4 of volume 1.

It should also be pointed out that Gürke's original publication of *C. buchneri* was in 1893, not in "1894" as stated on the volume titlepage and as sometimes cited.

Vernacular names reported for this species are "lukandambo", "munega", "tshitushi", and "vavengariha". Collectors have found the plant growing in red or sandy soils or loam, on herbaceous or woody savannas, dry steppes, anthills, hillsides, and partly wooded plateaus, in open forests and woodlands (especially *Brachystegia* woodlands), secondary forests and fallow land, among long grass in the dense *Acacia* zone, and in the open ground which was once *Brachystegia* woodland, at 800--2000 m. altitude, in flower from October to April, as well as in June and August, and in fruit in April, June, and August.

Lewalle (1972) records the species from Burundi, citing *Lewalle* 1164; Astle (1968) lists it from Zambia, citing *Astle* 1926. Hirschberg found it to be "common" in Zaire, while Allen reports it similarly common in Zimbabwe. White (1977) lists it for the Zambezian ecologic region, while Hegi (1903) gives its distribution as the Congo district of tropical Africa. Gürke (1903) encountered it "Auf Sandboden am Rande von Elefantbusch, unweit einer wasserhaltenden Pfanne", citing his no. 533 and giving its distribution as only the Congo region and Angola.

Quarré comments regarding *C. buchneri*: "petite herbacée sous ligneuse a bois brun, feuilles vertes très lissé a nervures en relief et blanche..... Cette forme est commune, c'est une sorte d'herbacée a

tige brune a peine semiligneuse mais dont la racine est très ligneuse et semble provenir d'un grand arbrisseau."

The leaves are all alternate from top to bottom of the stems on Bredo 3802, Homblé 905, and Ringoet 375 & s.n. [1920], mostly alternate on Ringoet s.n. [9/3/12], and both alternate and approximate on Quarré 4172. Galled flowers are seen on Bequaert 240, Homblé s.n., and Mendes 2038, making huge bignoniaceous-like corollas to be formed.

In all cases where a collector or author gives the corolla color for this species it is given as "white" except for Richards 19653 where it is described as "cream" color.

It is of at least passing interest to note how Baker (1900) separates this and his other supposed species from their capitate-flowered relatives:

1. Leaf-blades obovate-lanceolate.....*C. buchneri*.
- 1a. Leaf-blades oblong.
2. Corolla-tube 2--2½ inches long.....*C. strictum*.
- 2a. Corolla-tube 3--4 inches long.....*C. capitatum*.
- 2b. Corolla-tube 4--5 inches long.....*C. fischeri*.
- 1b. Leaf-blades cordate-ovate.
3. Leaf-blades thin-textured.....*C. hysteroanthum*.
- 3a. Leaf-blades subcoriaceous.....*C. megasepalum*.
- 1c. Leaf-blades obovate-cuneate.
4. Leaf-blades 3--4 inches long.....*C. cuneifolium*.
- 4a. Leaf-blades 8--12 inches long.....*C. grandifolium*.
- 1d. Leaf-blades ovate-orbicular, basally rounded.....*C. speciosum*.
- 1e. Leaf-blades cordate-orbicular.....*C. orbiculare*.

Of these, *C. cuneifolium* and *C. strictum* are now regarded as conspecific with *C. buchneri*, while *C. hysteroanthum*, *C. megasepalum*, *C. orbiculare*, and *C. speciosum* are now regarded as conspecific with *C. angolense* Gürke.

For *C. buchneri* Hutchinson (1946) cites his no. 3685; Richards & Morony (1969) cite Bull 2078 and Richards 769, 7325, 8335, 19653, & 22070 from Mbala; and Thomas (1936) cites from Angola: Baum 533, Buchner 572, Gossweiler 1050 & 9608, Pocock 216, and Welwitsch 9685; from Zaire: Hock s.n., Mechow 557a, and Pogge 544; and from Tanganyika: Fromm-Mllnzner 86 and Kassner 3066a. Good & Exell (1930) cite Gossweiler 1050 & 2334 from Angola.

Material of *C. buchneri* has been misidentified and distributed in some herbaria as *C. capitatum* Schum. & Thonn. and *C. formicarum* Gürke. On the other hand, the Lemos & Macuácuá 50, distributed as *C. buchneri*, actually is *C. mossambicense* Klotzsch, while Herb. IRLCS.511 is *C. tanganyikense* J. G. Baker and Peter 25046 and Swynerton 45, distributed as *C. strictum*, are *C. capitatum* var. *cephalanthum* (Oliv.) J. G. Baker.

Citations: ZAIRE: Bequaert 240 (Br), 240bis (Br); Brande 216 (Br); Bredo 3789 (Br), 52049 (Br); Callens 3107 (N); Dubois 1308 (Br, Br); Giorgi 342 (Br), 367 (Br), 413 (Br), s.n. [Envir. Elisabethville, 1923] (Br, Br, Br, Br, Br, Br, N); Hirschberg 230 (Af--3393); Hock s.n. (Br, Ld--photo, N--photo); Homblé 905 (Br, Br), s.n. (Br); Malaisse 6138 (Ld); Quarré 167 (Br, Br, N), 1763 (Br), 1958 (Br), 3180 (Br, Br), 4172 (Br, Br), 4838 (Br, Br, Br), 6092 (Br).

[to be continued]

BOOK REVIEWS

Alma L. Moldenke

"INSECT ECOLOGY" Second Edition by Peter W. Price, xvi & 607 pp., 243 b/w fig. incl. 31 maps, 65 tab. & 13 draw., Wiley-Interscience Publication, John Wiley & Sons, New York, N. Y. 10158. 1984. \$37.50.

I came across a copy of the first edition (1975 and not reviewed in this journal) and was very favorably impressed. This new edition is even better, richly updated, provided with an unusually full bibliography and special bibliographic directions at ends of chapters, illustrated with effectively helpful tables and figures, with text presented clearly and interestingly, and with orientation for "advanced undergraduate and graduate student levels". It analyzes the major components and processes in ecosystems in terms of the small-bodied insects; it analyzes trophic relationships, demography and population dynamics, communities, distribution, paleoecology and biogeography. The author's major objective is to make "insect ecology as interesting and exciting for the reader, as it is for me" -- a wonderful orientation for all texts and classroom teaching.

"COLECTORES DE PLANTAS DE LA HISPANIOLA" by José de Jesus Jimenez, 196 pp. & 13 b/w photos. Universidad Catolica Madre y Maestra, Publications Department, Santiago, Dominican Republic. 1985.

This historically valuable and botanically useful book has been in preparation for 12 years by the recently deceased author and presented for publication by his son through the above-mentioned university that now holds his extensive herbarium and his botanical and classical library, making it the best source for such related studies on the island. The prologue is written by Henri Alain Liogier, often a botanical confrere of the author. For each botanist discussed in the book is given the nationality, dates of birth and visit(s) to Haiti and/or the Dominican Republic, his or her collection interests and places of specimen deposit, and pertinent publications. The photos are of some of the collectors. There are two helpful indexes: one is of the 192 botanists listed alphabetically and the other is of the collectors listed chronologically starting with Jean Baptiste Tertre in 1656 and ending with Thomas Zanoni in 1980. Dr. Jimenez started life as a naturally brilliant and naturalist-inclined youngster. He became not only an outstanding botanist but also an important medical doctor and a loving family member. He seems to have achieved in each day at least 72 hours of work in his two professions, in his civic contributions, with his grateful family and in his courteous and helpful welcome and assistance to visiting botanists. My husband and I were privileged to have been able to number him among our most respected and cherished friends.

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